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LECTURE I.

IN selecting the subject of the lectures I have chosen cardiac dyspnœa, a symptom present in many diseased persons, because a number of observations bearing on this subject have been made in the last few years in the department under my direction by several members of the staff.

In considering the disturbances of respiration that result from disease, the respiratory apparatus may be regarded as consisting of the following structures: (*a*) the respiratory centre situated in the medulla oblongata; (*b*) the lungs, respiratory passages, walls of the thoracic cavity, and the muscles of respiration forming the respiratory mechanism; and (*c*) the blood and the circulatory apparatus.

The respiratory centre sends impulses to the muscles of respiration, which so alter the size of the thoracic cavity that the lungs expand and contract alternately, and the air sacs within the lungs are kept supplied with air from the external atmosphere through the respiratory passages. By this means the blood circulating through the lungs continually takes up oxygen from the air sacs, and being then distributed to the tissues of the body supplies these with the necessary oxygen for their needs, and taking up carbon dioxide from the tissues carries it to the lungs, where it passes into the air sacs and so into the external atmosphere.

That the necessary amount of oxygen may be economically supplied to the tissues of the body under the varying conditions of normal life, and the carbon dioxide efficiently removed, a close coördination between the respiratory centre and the blood-flow is essential. Increased activity of the body requires increased oxygen-supply, and results in increased blood-flow and increased ventilation of the air sacs. This increased ventilation is the result of increased activity of the respiratory centre. The variations in pulmonary ventilation that necessarily are taking place all the time in normal life are not noticed by the individual. They do not give rise to consciousness of their occurrence. Extreme degrees of increased respiratory activity, however, in healthy individuals give rise to unpleasant sensations called breathlessness or dyspnœa. In diseased states dyspnœa may occur much more readily than in health. In diseased states subjective distress will result from an increase in activity of the body that in health would cause no change of which the individual is conscious, though in health an increase of respiratory activity and an increase in ventilation have occurred. As Means [1] has pointed out, it is only when the respiratory mechanism cannot perform the task demanded of it that the movements enter the field of consciousness. He states: "Dyspnœa will occur whenever the respiratory mechanism cannot with ease functionate to the extent that bodily processes require." Increased respiratory activity without distress or consciousness of effort may be termed hyperpnœa, and this is present at some stage previous to the development of dyspnœa—at any rate, in health. In disease, however, there may be dyspnœa without actual increased ventilation—for example, in the presence of lesions of the respiratory mechanism that mechanically prevent increased ventilation. By adopting this conception of dyspnœa, an analysis of the causes of dyspnœa involves, as Meakins and Davies [2] have pointed out, the consideration of: (1) factors causing increased pulmonary ventilation or hyperpnœa; and (2) factors causing inability of the respiratory mechanism to meet the demands for increased pulmonary ventilation, and so distress.

INCREASED VENTILATION.

In his book on "Respiration" J. S. Haldane [3] has discussed very fully the factors that may affect the respiratory centre to cause increased respiration. These factors may be divided into chemical and nervous. The chemical factors that are known to influence the activity of the respiratory centre are: (1) the pressure of oxygen; (2) the pressure of carbon dioxide; and (3) the H-ion concentration in the blood supplied to the centre.

It may be assumed that in healthy individuals the partial pressures of the gases in the arterial blood are almost equal to the pressures of these gases in the alveolar air, and the pressures in the alveolar air can be varied by varying the composition of the inspired air. Lowering of the pressure of oxygen in the inspired air, as occurs gradually in balloon ascents, &c., is not accompanied by altered respiration, but a rapid lowering of the oxygen in the inspired air results in immediate and severe hyperpnœa. Haldane and Poulton [4] showed that the failure of a gradual reduction of oxygen to cause noticeable hyperpnœa is due to the gradual lowering of the carbon dioxide pressure that results from the slight increase in ventilation that takes place, and that this lowering of carbon dioxide pressure has not time to occur in the rapidly produced lowering of the oxygen tension. They concluded that the effect of reduced oxygen pressure in the arterial blood is to lower the threshold of the centre for carbon dioxide, so that it is stimulated by lower carbon dioxide pressures when oxygen deficiency is present. Haldane, Meakins, and Priestley [5] investigated the respiratory response to lowered oxygen pressures and concluded that "the respiratory response to oxygen-want is in three stages: (*a*) increased depth of respiration and increased ventilation per minute, owing to lowered carbon dioxide threshold; (*b*) periodic breathing, unless the oxygen-want is considerable; and (*c*) frequent and correspondingly shallow breathing." These conclusions, based on observations involving the reduction of the oxygen pressure in the arterial blood, may be accepted as the effect of oxygen-want on the respiratory centre no matter how produced. In any condition in which the supply of oxygen to the tissues of the centre is not sufficient for the needs of the centre these effects may be expected.

Haldane and Priestley [6] showed that changes in the carbon dioxide pressure in the alveolar air cause pronounced changes in ventilation. An increase of carbon dioxide pressure of 1·5 mm. over the normal 40 mm. of Hg doubles the pulmonary ventilation, and a fall of the same extent causes apnœa. This action is independent of afferent nervous stimuli to the centre, and is due to the changes in the carbon dioxide pressure in the arterial blood supplied to the centre. There is still much doubt as to whether this action is a specific one due to carbon dioxide or whether it is an action common to all acids.

Beddard, Pembrey, and Spriggs [7] showed that excessive breathing is characteristic of the state of acidosis, and this led to the appreciation of the fact that a rise of hydrogen-ion concentration in the arterial blood due to any acid acts as a stimulant to the respiratory centre. The addition of a fixed acid, such as occurs in the ketosis of diabetic coma, results in a combination of the acid with base, so that less base is available for the carriage of carbon dioxide. This will cause a rise in the ratio of dissolved carbon dioxide to combined carbon dioxide. Hasselbalch [8] showed that this relationship—the ratio $H_2CO_3/NaHCO_3$—is the most important indication of the hydrogen-ion concentration in the blood. A lowering of the denominator due to the abstraction

of base to combine with an increase of some fixed acid will result in an increase in the value of the ratio and an increase of hydrogen-ion concentration until the carbon dioxide pressure, and therefore the volume of dissolved carbon dioxide—the numerator in the ratio—can be lowered by increased respiratory activity. Lowered carbon dioxide pressure in the alveolar air will thus be produced, with lowered pressure and lowered volume of carbon dioxide in the arterial blood, until the ratio returns to its original value.

In this way it seemed possible to regard the effect of carbon dioxide on the centre as an effect of change in hydrogen-ion concentration rather than a specific effect of carbon dioxide. Hooker, Wilson, and Connett,[9] however, showed that blood at a given hydrogen-ion concentration with a high carbon dioxide pressure caused a stronger stimulation of the respiratory centre than blood at the same hydrogen-ion concentration with a low carbon dioxide pressure. This suggested a specific action from carbon dioxide, and Scott[10] and Collip[11] came to similar conclusions. The work of Jacobs[12] allows of a reconciliation between these opposing views. He demonstrated that dissolved carbon dioxide has a greater power of penetrating cell membranes than combined carbon dioxide has. This fact would account for the apparent greater influence of carbon dioxide compared with other acids, and permits the conclusion that the real stimulus is the hydrogen-ion concentration within the tissues of the respiratory centre itself. In health the hydrogen-ion concentration at the centre will no doubt be mainly regulated by the condition of the arterial blood, but it is the condition in the centre itself that determines its activity.

Whether increased breathing is the result of increased carbon dioxide in the arterial blood, or of an increase of fixed acids, or of oxygen-lack, may be determined by an examination of the arterial blood. In the first case there will be an increase in the content of the carbon dioxide in the blood and a high carbon dioxide pressure. When the stimulation is due to an increase of fixed acids, there will be diminished carbon dioxide content and a lowered carbon dioxide pressure through increased ventilation. In both cases the stimulus to the centre will be a raised hydrogen-ion concentration and the arterial blood will be saturated with oxygen to the normal extent. When hyperpnœa is due to oxygen-lack in the arterial blood, and the resultant lowering of the threshold of the centre to carbon dioxide pressure and to hydrogen-ion concentration, the arterial blood will show a lowered carbon dioxide content and pressure from increased ventilation and a lowered hydrogen-ion concentration, and will be saturated with oxygen to an extent less than normal. If, however, there is increased breathing due to some stimulus at the centre other than an abnormality in the quality of the blood supplied to it the examination of the arterial blood will show normal saturation with oxygen, low carbon dioxide content and pressure, and low hydrogen-ion concentration. These differences are shown in Table I.

TABLE I.

Cause of hyperpnœa.	Changes in arterial blood.			
	O_2 saturation.	CO_2 volume.	CO_2 pressure.	H-ion concentration.
O_2 lack in arterial blood	Low.	Low.	Low.	Low.
CO_2 excess in arterial blood	Normal.	High.	High.	High.
Fixed acids in excess	,,	Low.	Low.	,,
Stimulus at centre independent of quality of arterial blood	,,	,,	,,	Low.

On the examination of the arterial blood in cases of hyperpnœa single observations give results that occasionally indicate one of these conditions to be present. As a rule, however, this is not so, since the body cannot be considered as a respiratory system only. Changes in the reactions of the tissues generally, and of the renal organs especially, take place at the same time as the respiratory functions are disturbed, or as a result of the disturbance. Henderson and Haggard[13] showed that in the presence of an altered carbon dioxide pressure in the blood a readjustment of base takes place between the tissues and the blood, so that the amount of alkali available for the carbon dioxide is altered. The alteration is in such a direction that changes in the hydrogen-ion concentration are prevented or are minimal. In the diseased states in which hyperpnœa occurs more than one of the type conditions may be present—for example, in pulmonary lesions both oxygen-lack and raised carbon dioxide pressure may be present—and kidney disturbances with faulty excretion of acid bodies may be present at the same time as pulmonary or circulatory abnormalities.

There is evidence pointing to influences on the respiratory centre by afferent nervous impulses. The reflex of Hering and Breuer[14] acts through the vagus, and consists of afferent impulses consequent on the act of inspiration whereby inspiration is checked and expiration occurs. The stimulus for these impulses is unknown, but the stretching of the lung substance has usually been regarded as the effective agent. The removal of these afferent impulses by section or freezing of the vagi results in slower and deeper breathing.

Laqueur and Magnus[15] demonstrated that rapid breathing results in animals from the inhalation of phosgene gas. Dunn[16] showed that rapid breathing resulted when a fine emulsion of potato starch was introduced into the pulmonary circulation and produced obstruction of capillaries or of the finer arterioles. This rapid breathing was independent of oxygen-want, and was abolished by section of the vagi. Binger, Brow, and Branch[17] repeated Dunn's experiments and confirmed his observations. They showed that section of the vagi converted also the increased breathing that resulted from oxygen-want or carbon dioxide excess into a slow deep rhythm, and give reasons for doubting that the rapid breathing is due to afferent stimuli of the centre. In their opinion structural changes in the lung substance limited the variations in lung volume on inspiration and expiration and produced shallow breathing, and that the shallow breathing led to rapid breathing through the Hering-Breuer reflex. It is doubtful whether such rapid breathing, due to mechanical limitation to inflation and deflation, results necessarily in hyperpnœa in the sense of increased alveolar ventilation, but it is probable that it can be a factor in the production of subjective discomfort or dyspnœa.

The higher centres can also affect the respiratory centre. The voluntary control of respiratory movements is evidence of this, and it is probable that the tachypnœa seen in hysteria and in emotional states is of a similar nature. In addition to the afferent stimuli from the lungs there may well be influences on the centre through the nervous system from other parts of the body. The immediate cessation of the respiratory movements on plunging into cold water is suggestive of a reflex from the skin, but there is no clear evidence of the paths of these reflexes if they do exist.

In the last few years a considerable number of observations have been made in various countries in an endeavour to elucidate the mechanism of the dyspnœas seen in cases of heart failure. With the help of my colleagues, G. Graham, C. F. Harris, D'Arcy Prendergast, R. Hilton, and G. C. Linder, a number of observations have been made on patients with cardiac disease in the past three or four years, and I propose next to discuss these results, to compare them with the results of other observers, and to discuss their bearing on the solution of the problem of cardiac dyspnœas. These observations have a bearing on the causes of hyperpnœa, and consist of examinations of arterial blood. For work of this

nature, involving the quantitative estimation of blood gases and of blood reactions, several observers, working as a team, are necessary. The persons constituting the team have had unavoidably to be changed from time to time, but the work of the team has been consecutive, and I have the permission of my colleagues to utilise the results in this discussion.

A group of cases of heart failure accompanying mitral stenosis and auricular fibrillation were investigated because such cases show marked dyspnœa as a rule, and because this condition is seen in younger patients, so that it is possible to obtain a state of heart failure uncomplicated by lung disease, such as chronic bronchitis and emphysema, or by the vascular and renal changes so common in older patients. In addition groups of cases of heart failure with high blood pressure and arterial disease, and with asthma or chronic bronchitis and emphysema, have been studied.

Oxygen Saturation of Arterial Blood.

The group of cases with mitral stenosis and auricular fibrillation consisted of eight patients, all of whom had severe dyspnœa on admission. The observations were frequently not made until a few days after admission, when some degree of recovery had occurred, but all had marked dyspnœa and orthopnœa at the time. All but one had râles at the bases of the lungs and some œdema there, though slight. In some cases second or third observations were made during recovery, and in two instances observations were made on second admissions for recurrence of heart failure. The blood was obtained by puncture of the femoral artery, and the oxygen capacities and saturations were estimated by the Haldane apparatus for blood-gas analysis.

The results are shown in Table II. The saturation of the arterial blood with oxygen in health should not be lower than about 95 per cent. One case only had a value clearly lower than this, No. 5. It is of

TABLE II.

Oxygen saturation of arterial blood in cases of mitral stenosis and auricular fibrillation, with dyspnœa and orthopnœa.

Case No.	Sex.	Age.	Date.	Ventricular rate.	Dyspnœa.	Cyanosis.	Oxygen capacity vols.	Oxygen saturation.
							%	%
1	F.	35	15/12/24	90	+	+	17·25	98
2	M.	25	22/12/24	116	+ +	Sl.	17·7	97
			12/1/25	70	−	−	16·9	97
3	F.	43	18/6/23	104	+ +	+	−	96
			25/6/23	80	+	+	−	95·3
			9/7/23	52	+ +	+	−	97·5
			4/1/25	150	+ + +	+ +	16·4	98
			19/1/25	76	+	+	17·5	98
4	F.	27	9/11/25	60	+ +	+	18·4	97
			7/12/25	76	+	+	17·2	96
			13/4/26	76	+ +	+	17·9	97
5	M.	34	25/1/26	70	+ +	+	14·4	92
			8/2/26	72	+ +	+	15·8	84
6	F.	26	8/12/24	64	Sl.	Sl.	14·0	100
7	M.	59	23/4/23	78	+	+	−	94·4
8	F.	67	16/6/24	76	+	+	21·2	93·8

Sl. = Slight.

interest, further, to note that at the second observation on this patient, at a time when he seemed somewhat improved in general condition, the oxygen saturation was still lower than on the first occasion. The dyspnœa, cyanosis, and œdema were not more marked in this patient than in several of the others, but he was peculiar in that there was friction at both bases on admission, and that on the occasion of the second observation he was complaining of acute pain in the right side of the chest, where fine friction was audible. It is probable, therefore, that in addition to heart failure this patient had an inflammatory lesion in the lungs, or possibly an infarct. All the others showed normal saturation, both during the stage of severe failure and, in the cases where second observations were made, in the stage of recovery or improvement. Case 2 is of special interest, because the attack of heart failure was acute and of short duration and because the second observation was made after the auricular fibrillation had ceased and normal cardiac mechanism been restored by the use of quinidine. The observations on Case 3 are peculiarly valuable, because they extend over a period of two years and because of the extreme degree of failure and of dyspnœa at the time of the fourth observation. At the time of the first observation on Case 4 a severe degree of digitalis intoxication was present and was the cause of the increased failure that necessitated admission to hospital.

The group of cases with high blood pressure and arterial disease consists of six patients. There was no evidence of endocarditis in any of them. They were on the whole considerably older than those of the first group. Cyanosis was not so obvious, and the dyspnœa tended to occur in attacks, but dyspnœa and orthopnœa were present in all at the time of the arterial puncture. In two instances the Cheyne-Stokes type of periodic breathing was seen. The results are shown in Table III. In this group also the

TABLE III.

Oxygen saturation of arterial blood in cases of high blood pressure, arterial disease, and myocardial degeneration, with dyspnœa and orthopnœa.

Case No.	Sex.	Age.	Date.	Pulse-rate.	Dyspnœa.	Cyanosis.	Oxygen capacity vols.	Oxygen saturation.
							%	%
9	M.	60	28/9/25	80	+	−	17·3	96
			31/11/25	108	+ +	−	13·8	96
10	M.	70	24/11/24	75	+	−	17·5	98
			1/12/24	100	+	+	18·3	91
11	M.	61	5/10/25	75	+	−	18·0	95
12	M.	58	11/2/24	64	+ P.	Sl.	16·8	100*
			25/2/24	75	+ Sl. p.	−	18·0	96†
			17/3/24	58	Sl.	−	16·7	97·7
13	F.	53	28/1/24	80	+ + +	+ +	17·3	87·8
			3/3/24	84	+ +	+	21·0	86·7
			31/3/24	88	+	Sl.	18·0	99
14	F.	48	21/6/26	90	+	+	14·4	91

P. = Periodic.
* Blood drawn during hyperpnœic phase.
† Blood drawn during both phases.

absence of unsaturation of the arterial blood is the striking feature. Case 9 had œdema of the legs and ascites, a right bundle-branch lesion, and numerous ventricular extrasystoles. The systolic blood pressure was 166 mm. of Hg and the diastolic 120 mm. The condition had commenced to improve at the time of the first observation. The second observation was made during a paroxysmal attack of dyspnœa, and the oxygen saturation was the same as before. There was a striking fall in the oxygen capacity and hæmoglobin content of the blood, but this was probably due to the onset of erysipelas that became manifest next day, and from which he died nine days later. Case 10 was very similar, but had Cheyne-Stokes breathing a day or two before the first observation. At the time of the second observation he was much worse and was unconscious. There was then distinct cyanosis, and an oxygen saturation of only 91 per cent. He died a few hours later. Case 11 had chronic gout, a right bundle-branch lesion, and blood pressure of 174 mm. systolic and 116 mm. diastolic. There was no œdema, but orthopnœa was constant. This patient was liable to attacks of severe nocturnal dyspnœa, when cyanosis appeared with diffuse râles in the lungs and blood-stained sputum. Case 12 had a blood pressure of 294 mm. systolic and 170 diastolic. There was some œdema of the legs and albuminuric retinitis. The blood-urea was only 0·055 per cent. At the time of the first observation there was pronounced Cheyne-Stokes breathing, and the arterial blood was drawn during a period of hyperpnœa. At the second observation the condition had improved, there was till a periodicity in the respiratory rhythm, but there were no

definite apnœic pauses. At the third observation the condition was greatly improved, the breathing had lost all periodicity, but orthopnœa was still present. Case 13 is important, as it showed marked oxygen unsaturation. This was the only case in the group that showed cyanosis comparable in degree with that of the cases of mitral stenosis and auricular fibrillation in the first group. The cyanosis was of a more leaden hue than in the cases of the first group. The blood pressure was 234 mm. systolic and 150 mm. diastolic. Generalised œdema was pronounced, and there was ascites and fluid in the pleural cavities. At the time of the first observation improvement had commenced and was well marked by the time of the second observation. When the third observation was made the patient had commenced to get up; there was no obvious œdema nor ascites. There were still some râles at the bases of the lungs. It is of importance to note that at the second observation, when the patient's general condition was greatly improved and the dyspnœa, œdema, and cyanosis were less, the oxygen saturation of the arterial blood had not increased. Case 14, who also showed a definite oxygen unsaturation, had œdema of the legs and râles at the bases of the lungs. There was marked orthopnœa and definite cyanosis. The blood pressure was 262 mm. systolic and 152 mm. diastolic. Severe exacerbations of dyspnœa occurred from time to time, and six weeks after the arterial blood was examined the patient died in uræmia. Autopsy showed chronic interstitial nephritis. At the time of the observation on the arteria blood the blood-urea was 0·060 per cent., and the patient's condition was essentially one of heart failure.

The third group comprises three cases in which definite pulmonary disease was present in addition to heart failure. The results of the estimation of the oxygen content of the arterial blood are shown in the first part of Table IV. Case 15 had aortic regurgitation and a greatly hypertrophied and dilated heart. There was a history of bronchial asthma extending over many years, and pronounced emphysema was present. The observations extend over two periods of admission to hospital. On both occasions at the first observation on the arterial blood severe orthopnœa was present. There was œdema of legs and back and râles at the bases of the lungs. On all occasions the oxygen saturation of the arterial blood was within normal limits. Case 16 had a long history of bronchitis and of bronchial asthma. The blood pressure was 180 mm. systolic and 92 mm. diastolic, and the heart was hypertrophied and the arteries hard. Orthopnœa was present and there were râles at the bases of the lungs and rhonchi all over. There was slight cyanosis and œdema of the back and legs. The patient was commencing to improve when the arterial blood was examined, and the oxygen saturation was at the lower limit of the normal. Case 17 was that of a man, aged 35, with severe chronic bronchitis and emphysema. The right side of the heart was enlarged and the fingers clubbed. Cyanosis and orthopnœa were marked. The lower thorax was sucked in with each inspiration, and râles and rhonchi were numerous over both lungs. In this case the oxygen saturation was definitely low.

TABLE IV.

Oxygen saturation of arterial blood in three cases of chronic pulmonary disease with heart failure, and in two cases of heart failure not included in other groups. All had dyspnœa and orthopnœa.

Case No.	Sex.	Age.	Date.	Pulse-rate.	Dyspnœa.	Cyanosis.	Oxygen capacity vols.	Oxygen saturation.
							%	%
15	M.	51	15/6/25	75	++	Sl.	19·5	100
			29/6/25	75	+	Sl.	19·75	100
			15/2/26	96	+++	+	19·3	100
			22/2/26	84	+	Sl.	19·8	96
16	M.	59	7/6/26	80	+	Sl.	17·5	94
17	M.	35	19/10/25	80	++	++	19·4	91
18	M.	56	18/1/26	92	+A.p.	Sl.	16·3	96
19	F.	65	12/10/25	†	Sl.	−	14·3	92

A.p. = Angina pectoris.

In Table IV. are included two cases that do not fall into any of the above groups. Case 18 had aortitis and aortic regurgitation, probably syphilitic in origin, and suffered from attacks of angina pectoris. The arterial blood was taken during an attack when there was orthopnœa, a clammy sweat, and distinct cyanosis. There were râles at the bases of the lungs, and the respiratory movements were irregular, apparently from involuntary interference. The oxygen saturation was normal. Case 19 was that of a frail woman, with carcinoma of the uterus and considerable emaciation. There were numerous ventricular extrasystoles, a few râles at the bases of the lungs, and slight orthopnœa. There was no apparent cyanosis and the oxygen saturation was definitely reduced.

These results point to the absence of a consistently low oxygen saturation in the dyspnœa of heart failure. In general the saturation is within normal limits, and it would appear that it is in exceptional cases only that a low saturation is seen. The cases in this series in which a low saturation was found are of interest. Cases 5 and 17 had evidence of pulmonary disease in addition to heart failure. Case 19 had carcinoma of the uterus, and the patient was in a feeble dying condition. At the time of the second observation on Case 10 the patient was unconscious and died a few hours later. Case 13 recovered, but on admission was in an extremely critical condition, with severe congestive failure and a considerable amount of fluid in the pleural cavities. Case 14 did not appear so seriously ill on admission as Case 13, but did not respond to treatment, and died in uræmia of chronic interstitial nephritis a few weeks later.

The results of other observers are in general agreement with these observations. Harrop,[13] Barach and Woodwell,[19] Campbell, Hunt, and Poulton,[20] Peters and Barr,[21] and Meakins, Dautrebande, and Fetter [22] have published their observations and these have been collected and discussed by Meakins and Davies.[2] They conclude that unless there are obvious pulmonary disturbances present as a result of the heart failure the oxygen saturation of the arterial blood is within normal limits. The results in this series hardly justify such a conclusion, but any criticism must depend on the meaning of the word "obvious." We endeavoured, when possible, to select cases that had little evidence of pulmonary involvement, but all had obvious respiratory distress when at rest in bed, and with few exceptions there were râles at the bases of the lungs at the time of observation. Of the cases with mitral stenosis and auricular fibrillation Case 6 alone was without pulmonary râles. In the second group Cases 9, 11, and 12 were free of basal râles. The results recorded by Eppinger, Papp, and Schwarz [23] are in agreement with the observations in this series, and it would appear that some notice must be taken of the cardiac lesion accompanying the heart failure. In cases of mitral stenosis a degree of œdema of the bases of the lungs that can be recognised clinically may be present without oxygen deficiency in the arterial blood, but in heart failure due to myocardial degeneration, pulmonary congestion, and œdema are usually accompanied by oxygen deficiency.

Cyanosis.—Lundsgaard and Van Slyke [24] have discussed the factors responsible for cyanosis, and have pointed out that two factors may be present in heart failure—peripheral stasis and deficient oxygenation of the blood in the lungs. They suggest also that distension of capillaries and an increase in the number of open capillaries may be contributing factors. They point out that in mitral valve disease cyanosis may appear at an earlier stage of failure than in other types of heart disease. A comparison of the results shown in Tables II. and III. shows agreement with

this, and justifies the conclusion that while cyanosis is pronounced in cases of mitral stenosis, even when there is no deficient oxygenation of the arterial blood, in cases of myocardial degeneration cyanosis is only pronounced when failure is advanced, lung involvement severe, and deficient oxygenation of the arterial blood present. Case 2 is exceptional in that only slight cyanosis was noted, even when dyspnœa was severe. It is possible that a definite aortic regurgitation, which was present in addition to mitral stenosis, may account for the peculiarity in this instance.

It is justifiable to conclude, therefore, that oxygen deficiency in the arterial blood or deficient oxygenation of the blood in the lungs is not present with any consistency in cases of cardiac dyspnœa. It is found when: (*a*) pulmonary disease is present in addition to heart failure; (*b*) in the presence of gross congestion and œdema of the lungs; and (*c*) in feeble or dying patients.

It is conceivable that the normal oxygen saturations are the result of increased ventilation, and that the increased ventilation is primarily due to a deficiency in the oxygenation of the arterial blood. If a deficiency were primarily causal the percentage saturations in the presence of severe dyspnœa would be at best about the lower limits of the normal. But this is not so. In most instances the figures are well within the normal limits. Further, it is difficult to support the view that arterial oxygen deficiency is a cause of the dyspnœa in Case 13, in which a lower saturation was found at the second observation when the patient was greatly improved in general condition and the dyspnœa was markedly less than at the time of the first observation. That it is only because of the hyperpnœa that the oxygen saturations are maintained within normal limits is probable. Morphia, ⅓ gr., was administered hypodermically in Case 15, and an examination of the arterial blood drawn half an hour later showed a drop in the oxygen saturation from 100 to 80 per cent., accompanied by a cessation of the distress and of the exaggerated respiratory movements.

If, then, there is a cause of the hyperpnœa and dyspnœa of heart failure common to all cases, it cannot be deficient oxygenation of the blood in the lungs.

(The bibliography, to which references are given in this lecture, will appear with the third lecture).

Lettsomian Lecture

ON THE

SURGERY OF THE SPINAL CORD AND ITS MEMBRANES.

Being the Second Lettsomian Lecture in 1927, delivered before the Medical Society of London on March 9th, 1927,*

BY DONALD ARMOUR, C.M.G., M.B. TORONTO, F.R.C.S. ENG., M.R.C.P. LOND.,

SENIOR SURGEON TO THE WEST LONDON HOSPITAL AND SURGEON TO THE NATIONAL HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM.

IN 1908 Spiller read a paper before the College of Physicians of Philadelphia entitled Circumscribed Serous Spinal Meningitis, a Little Recognised Condition Amenable to Surgical Treatment. In 1903 a case had been reported by Spiller, Musser, and Martin, in which an exploration for a tumour had revealed only a cystic condition—"a delicate pial cyst"—of the meninges. Beyond doubting its possible parasitic origin, no suggestion was made as to its ætiology or pathogenesis.

In his paper Spiller said:—

"Almost nothing is known as to the origin of apparently idiopathic collections of fluid within the pia-arachnoid. The fluid may be from the blood-vessels of the pia, and the mesh-like structure of the leptomeninges may predispose to adhesions, but why these cysts occur in any given case, especially where there are no evidences of inflammation, we do not know. The symptoms are those of circumscribed compression of the spinal cord, and the condition cannot be distinguished clinically from tumour of the cord."

Since then an increasing interest has been shown in this condition, under many different designations, all descriptive of the local condition usually found, but none attempting to explain its ætiology or pathogeny. "Serous spinal meningitis" (Oppenheim), "localised hydrops of the meninges" (Schlesinger), "arachnitis adhæsiva circumscripta" (Krause), "chronic spinal meningitis" (Horsley), "arachnoïdite cloisonnée" (Bouché), "meningitis serosa und serofibrosa" (Gerstmann)—such are the various names used for a condition associated pathologically with the presence of adhesions between the spinal theca and the arachnoid, with consequent damming up under pressure, or with localised cyst formation, of the cerebro-spinal fluid, and evidenced clinically by the symptom-complex of a medullary compression.

* The first Lettsomian Lecture appeared in THE LANCET of Feb. 26th, 1927.

MENINGITIS SEROSA CIRCUMSCRIPTA.

Although the earliest description of this condition is attributed usually to Schlesinger, who, in 1898, described the post-mortem findings of a case of cord compression due to a localised hydrops of the meninges, it had been doubtless recognised long before this date. For there was published in Bonn in 1840 a thesis by one P. Schmitz entitled "De meningitide spinali quam vocant circumscriptam." I regret that a search of the libraries of London, Edinburgh, and Cambridge has been unproductive, and therefore, I cannot give you further details of his article. But the title clearly indicates that his subject must have borne a close relationship to the one I am now presenting.

I think it will simplify matters if I exclude at once certain conditions, which, while often associated with a circumscribed serous meningitis, do not form any part of my subject.

1.—*Extradural processes:*—(1) Infective or inflammatory disease of the vertebral column—e.g., Pott's disease, acute or chronic osteomyelitis, syphilis, typhoid spine, actinomycosis. (2) Extradural tumours.

2. *Intradural processes.*—(1) Intradural extramedullary tumours. (2) Intramedullary tumours.

The condition I am dealing with is characterised clinically by the progressive evolution of a compression paraplegia, and pathologically by meningeal adhesions, varying from fine discrete strands of translucent membrane, arising from the arachnoid and passing across the space between the dura and the cord, to adherent processes more or less completely surrounding the cord, either fixing the latter or dragging it laterally, and matting the roots. The cerebro-spinal fluid may be held up by a transverse partition formed by these processes, or retained in cyst formations of varying size. While the circumscribed location of the lesion gives to it its characteristic clinical picture, the adhesions and proliferation of the arachnoid are more or less diffuse, both above and below the neurological level, but the process remains harmless unless it produces compression of the cord.

Reference should be made to a similar pathological condition affecting the posterior fossa of the skull not as yet commonly recognised. While some cases are undoubtedly due to an infective process arising from otitis media, many others have an obscure ætiological origin. These cases may simulate cerebellar or cervico-medullary tumour. Horrax describes this condition as "cisternal arachnoiditis." The localisation of this process to the posterior fossa may even account for cases of hydrocephalus of obscure origin.

The Spinal Arachnoid Membrane.

Let me here recall a few points in the anatomy of the spinal arachnoid membrane. The arachnoid is a thin delicate non-vascular areolar tissue membrane lying outside the pia and connected with it by slender filaments of trabecular connective tissue. Above, it is continuous with the cerebral arachnoid, and on either side it is continued on the various spinal nerves to form a sheath for them. The outer surface of the arachnoid is in contact with the inner surface of the dura, both of which are lined by a layer of endothelial cells. The interval between them, merely a potential space, constitutes the subdural space and contains a small amount of fluid of the nature of lymph. The subdural and subarachnoid spaces nowhere connect with one another. The inner surface of the arachnoid is separated from the pia by a considerable interval, which is called the subarachnoid space. This space is largest at the lowest part of the spinal canal where it encloses the nerves forming the cauda equina.

Superiorly, it is continuous with the cranial subarachnoid space, and is brought into communication with the general ventricular cavity of the brain by means of the openings in the pia mater in the roof of the fourth ventricle. The spinal subarachnoid space is filled by cerebro-spinal fluid sufficient in amount to expand the arachnoid membrane, so as to completely fill up the whole of the space included in the dura mater. The subarachnoid space is occupied by subarachnoid tissue, trabeculæ of delicate connective tissue, connnecting the pia mater with the arachnoid, and, in addition, is partially subdivided by a longitudinal membranous partition, the septum posticum, which connects the pia and arachnoid opposite the posterior median fissure. This partition is incomplete and cribriform in structure, formed by interlacing bundles of white fibrous tissue. The space is also partially divided on either side into an anterior and posterior compartment by the ligamenta denticulata.

In structure the arachnoid membrane consists of distinct riband-like bundles of fine fibrous tissue, interlaced into one another, for the most part running in a longitudinal direction. Several layers of this tissue, arranged in a complex way, constitute the arachnoid membrane proper. The subarachnoid trabeculæ consist of fine fibrillar tissue, each of which is surrounded by a delicate nucleated sheath. The whole constitutes a typical areolar connective tissue, interrupted at numerous points and covered by a continuous layer of endothelial cells. The subarachnoid space contains numerous blood-vessels some of which are free and others attached to the arachnoid. Their adventitia is covered by endothelium; hence the subarachnoid space would seem to assume the character of a perivascular space.

Reactions of Membranes to Injury.

Let us now consider what are the reactions to injury, mechanical or chemical, of the membranes of the cord, as throwing light upon the formation of the adhesions so characteristic of the condition of meningitis serosa circumscripta. Very valuable and suggestive experimental work has been done on this subject by Sayad, Lear, and Harvey working together. They first investigated the reaction of the dura to injury with an uninjured arachnoid, and, secondly, the reaction of the injured arachnoid with an uninjured dura. The former experiment consisted in removing a circular piece of the dura through a trephine opening in the temporal region, every care being taken to avoid injuring the pia arachnoid lying beneath it. They found that the operative defect is filled at once by blood-clot, which on its inner face is lightly adherent to the arachnoid and on its outer intimately adherent to the exposed temporal muscle. The process of organisation of the clot begins at once and takes place in much the same way as elsewhere in the body. There is an immediate invasion of phagocytes, followed almost at once by wandering and polyblastic cells and then in time by fibroblasts. These all appear to come in large part from the overlying temporal muscle and to be evenly distributed throughout the clot. Those reaching the inner surface adjacent to the arachnoid membrane become arranged in a plane tangential to that surface and very soon there is a distinct skeletal arrangement of the cells corresponding to the architecture of the dura. A little later certain of these cells are arranging themselves along the inner face of the blood-clot in contact with the arachnoid, forming a limiting membrane resembling the endothelial lining of the normal dura. Sayad and Harvey think that it is highly probable that the endothelial or endothelial-like lining seen at this early period is derived from cells coming from the muscle side of the clot and not by an ingrowth of endothelium from the cut edge of the dura. This surface becomes complete at the end of a week and at this time the clot loses its fibrinous adhesions to the arachnoid. From this time on the process is largely one of growth and condensation of connective tissue behind the lining cells.

It is apparent, therefore, that healing of the dural defect takes place without the ingrowth of any fibroblasts into the arachnoid, so essential for the formation of adhesions. This impregnability of the arachnoid surface to the reaction of repair in the dura prevents the formation of adhesions, and acts as a mould forthe reconstruction of the dura.

As a corollary, it is of interest to see what happens in the healing of an injury to the arachnoid when the site of its injury is covered by normal dura. Lear and Harvey investigated this problem in a series of experiments. A dural flap was turned down with strict precautions against injuring the inner surface of the dura and the arachnoid. The pia arachnoid, well away from the line of dural incision, was subjected to a small sharply localised area of injury. As a result, it was found that where there was an injury to the pia-arachnoid, even though the overlying dura was uninjured, dense adhesions between all three layers of the meninges were formed. These adhesions formed early, became denser with time, and persisted. In order to exclude the possibility of the dural reaction being due to blood between it and the arachnoid, experiments were conducted in which blood was left between the dura and uninjured arachnoid. As might be expected, no adhesions were formed. In other words, blood in the presence of an intact arachnoid does not produce adhesions. Hence, a necessary premise to the formation of adhesions between the dura and arachnoid is injury to the latter, and the essential point would appear to be an injury to the outer cells of the arachnoid. Over the spinal cord, where the pia and arachnoid are widely separated from each other, such injury would probably not involve the pia, which might well act as another limiting membrane. Over the cerebral cortex, on the other hand, any reparative process in the arachnoid will probably stimulate a similar reaction in the pia, and, if sufficiently severe, in the cortex itself.

Why do the dura and arachnoid react in such different fashions when healing? Lear and Harvey suggest as an explanation, and they receive support from Clarke and from Lewis, that the dura is not lined with true endothelium, but rather by cells which have undergone a certain metaplasia from mesoblatic elements, in order to serve the same purpose. The lining cells of the dura, therefore, are less stable and enter readily into any adjacent inflammatory reaction. The lining cells of the arachnoid, however, are more highly differentiated than those of the dura and are, therefore, more stable in character. Thus it is that the inner surface of the dura does not act as a limiting membrane in the presence of an attempted repair in the underlying arachnoid, but, on the contrary, enters intimately into the process, with the result that the arachnoid, when injured, becomes adherent to the dura, and healing takes place with adhesions between them.

We may, I think, conclude from the foregoing findings, that in order to have adhesions it is not

necessary to have any injury to the dura whatever, but that damage to the lining cells of the arachnoid alone will result in the formation of adhesions. Moreover, the work of Esseck indicates that a relatively minor injury is sufficient to induce a cellular reaction in the interstices of the arachnoid. Ayer has shown, too, that, if such reaction is intensified, the actual destruction of lining cells may take place both within the interstices and on the surface of the arachnoid sufficient to lead to cicatrisation and the formation of adhesions. The application of what has gone before to our subject under discussion—viz., the pathogeny of meningitis serosa circumscripta, is this, that injuries, sometimes exceedingly slight, minimal birth injuries, mild attacks of serous meningitis, even the meningeal reactions that occur at the onset of many infectious diseases, may of themselves be sufficient to cause enough damage to the arachnoid to lead to adhesions, which later in life may be of clinical importance.

ÆTIOLOGY: MENINGITIS SEROSA CIRCUMSCRIPTA.

I think there can be no question that previous infections of the meninges, either primary or secondary, may be followed by a serous meningitis. Such undoubtedly occurs, as already mentioned, in the posterior fossa secondary to otitis media. This would explain the diffuseness of the condition so often found in the cord. Nor is it difficult to imagine that, in a more or less mild diffuse condition, the brunt of the reaction may have fallen upon one particular section of the arachnoid more than another, giving rise to a circumscribed lesion, more severe than elsewhere and the only one to make its presence known clinically. It may be remarked here that the majority of cases show a lower cervical or upper dorsal localisation. There is a patient now in the National Hospital in the service of Dr. Walshe, and upon whom I have operated, whose symptoms followed five months after an attack of epidemic cerebro-spinal meningitis. Oppenheim also refers to this as a cause. Bouché reports a case following upon an attack of typhoid three years previously, during which the patient had had symptoms of a meningitis. Horrax states with regard to serous meningitis localised in the posterior fossa that influenza and encephalitis are possible causes, there being evidence in favour of the latter. Flatau, Jacobsohn, and Minor regard meningitis serosa circumscripta as a "chronic inflammatory condition," but do not commit themselves further. Horsley invoked syphilis and gonorrhœa as the chief ætiological factor. I had the privilege of assisting him or of seeing the majority of his cases, and that they were not all cases of meningitis serosa circumscripta, as we now understand it, is clear from his own description. He describes a "shrunken cord, the seat of a sclerogliosis," and refers only in passing to meningeal adhesions. Sachs and Glaser have classified their experiences of cases showing symptoms of a compression paraplegia with a definite sensory level, which were operated upon, as follows:—

1. Those with normal looking cord and meninges.
2. Those with normal cord but with pathological changes in the meninges.
3. Those with pathological cord and normal meninges.
4. Those with pathological cord and meninges.

They describe the appearances of the cord in Group 3 as "small and white, with the vessels small and diminished in number," the so-called "cadaveric cord." Such was the condition in many of Horsley's cases. Oppenheim thought too that, at least in some of these cases, there is a combination of intramedullary lesion with the serous meningitis. Bruns was strongly of the opinion that an idiopathic condition exists, apart from any disease of the spine, meninges, or cord itself.

Traumatic Conditions.

The most important contributions concerning the ætiology of this disease in recent years refer to trauma as an ætiological factor. The importance of this, especially from a medico-legal point of view, cannot be exaggerated. Although cases had been reported by Krause, Weisenberg, and Müller, Bruns and others, in which a history of trauma had been obtained, it was not considered of any importance as a causative factor, and Horsley rejected it altogether. Müller, of Marburg, refers also to the operative trauma incident to the successful removal of spinal tumours as a cause of meningitis serosa circumscripta coming on slowly but progressively some years afterwards.

When one considers head injuries, in which so often localised adhesions of the meninges occur as an after-result, it is not difficult to conceive a like result occurring in the spinal canal following upon trauma. Gerstmann, in reporting six cases and describing them fully, rejects infection and primary disease of the spinal cord as ætiological factors, and regards trauma as the most common one. He maintains that a torsion or jarring of the vertebral column may cause a slight damage to the meninges, with resulting adhesions, which tend to be progressive in character. Probably the most important contribution to the subject is that of Mauss and Krüger. They found in 54 laminectomies for war wounds, 23 cases of meningitis serosa circumscripta. In all the origin was undoubtedly traumatic. In 14 there was direct injury to the spine, but in the remaining nine the injury was remote from the spine. In these cases they are of opinion that a commotion of the spinal column with its protected spinal cord, whether due to direct impact upon the spine or transmitted thereto through other parts of the skeleton is *the* ætiological factor. They suggest also that a mere traction of the plexuses may be a sufficient cause. They are of opinion that in the majority of cases the intradural process is not inflammatory, as such histological investigations as were carried out showed no evidence of such a process in the strands of arachnoid. They suggest, however, that the process begins as a pachymeningitis or peripachymeningitis following upon a peridural hæmorrhage. If we are to accept the conclusions formulated by Sayad, Lear, and Harvey, this alone would be insufficient and we most postulate damage to the cells of the arachnoid as well. However produced, we must, I think, regard trauma as a very important ætiological factor in the production of the disease.

Although offering no new evidence as to the ætiology of the condition, Stookey would explain the mechanism causing the disturbances in the cord as follows. With each respiratory excursion there is a dorsoventral movement of the spinal cord throughout its length of approximately 5 mm. in each direction, greater in the cervical and upper dorsal regions. If adherent bands are present, the cord is fixed at the points of attachment, while above and below it moves normally. Thus with each respiration angulation at the fixed segment occurs, which when constant and continued over a long period of time induces disturbances in cord conduction. He extends this theory to explain the more frequent occurrence of the localising lesion in the cervical and upper dorsal regions, where the respiratory excursions of the cord are greatest. He suggests also that, owing to the interference with the normal mobility of the cord by meningitis serosa circumscripta, slight injuries may be productive of a greater degree of traumatism to it than would have otherwise been the case. This is a very fascinating theory, but one which is obviously open to severe criticism.

Age and Duration.

Meningitis serosa circumscripta occurs most frequently in the fifth and sixth decades of life, but as Bruns had a case 16 years of age and my oldest was a man of 70, it obviously may occur at any age in adult life.

Though Stookey lays great stress upon the duration of the disease as a factor in differential diagnosis—50 per cent. of his cases having had a course of more than nine years—it is possible, however, to attach too much importance to the time element. Three of my own cases were of four, six, and nine months respectively, though another was of nine years'

duration. It may be said in general terms that the onset of the disease is usually slow and its development protracted.

SYMPTOMATOLOGY.

In general terms it may be said that the symptoms of meningitis serosa circumscripta are those of an extramedullary spinal tumour. But there are certain differences which make it possible to suspect or even to diagnose the former condition. One of these is the variability of the symptoms observed on examination at short intervals, which is the most characteristic feature of the clinical picture. This concerns pain, motor, sensory and sympathetic irritation phenomena, and the reflexes.

Unilaterality of symptoms marks the disease in its early stages. On the sensory side subjective symptoms predominate. Pains, paræsthesiæ, and hyperæsthesia are prominent symptoms. Pain is widespread, diffuse, and indeterminate in distribution, not localised, and referred to distant skin areas. Hyperæsthesia is generally extended to a whole limb, with "band" sensations at ankle, knee, abdomen, or neck. A uniradicular zone of hyperæsthesia at the upper level of the lesion is very rare. The pain and hyperæsthesia may be very intense and disabling apart from any loss of power. Sensory loss is often not complete and may present variable limits from day to day. It affects all modes of cutaneous sensibility equally in degree and extent. Stookey found marked involvement of vibratory and muscle, joint and tendon sense, with dissociation at times of these two varieties. A Brown-Séquard syndrome is frequently seen in this condition, and is characterised by slowness of progression and its almost daily variability. Further, also, by the fact that the sensory changes in the upper zones are more profound than those in distal zones. For example, one may find a complete loss over the trunk, while in the lower limbs only a partial loss may be present. This is a point that Collier has frequently emphasised.

On examination motor disturbances are more marked in most instances than sensory. Weakness of limbs at first limited to one side, then later involving the other, followed by paraplegia, or even quadraplegia. Irritative motor phenomena, multiradicular in type, may be present. In Mauss and Krüger's cases many showed a tendency to spontaneous or readily elicited reflex movements, a source of great discomfort to the patients, especially at night. Widespread twitching and fibrillation of muscles within the affected area also occurred. Contrary to Horsley and other observers, they found vasomotor, secretory, and trophic disturbances fairly common. These included hypothermia, cyanosis, redness, swelling, hyperidrosis, hyperkeratosis, and anomalies of the nails. Disturbances of bladder and rectum are either absent or occur rather late in the evolution of the disease. Dysuria and urgency of micturition are more characteristic than incontinence, which, when present, tends to be transient.

Mauss and Krüger report in cervical lesions, the sudden appearance of bulbar symptoms, dyspnœa, nystagmus, facial palsy, and limitation of head movements, all of which they regard as the strongest indications for operation, and which were permanently abolished thereby. Vertebral tenderness has been found in some cases, but when present bore no definite relation to the level of the lesion.

The Cerebro-spinal Fluid.

The cerebro-spinal fluid in meningitis serosa circumscripta varies as it does in spinal tumour, depending upon the completeness of the block. The absence of any increase in the protein content and of xanthochromia cannot be invoked, as Stookey claims, to differentiate this condition from spinal tumour. He says: "A prolonged history, a positive cerebro-spinal fluid manometer result, and a normal total protein content are the most important points in the differential diagnosis from spinal cord tumour." Analysis of the cases reported in the literature show that many had an increased protein content, varying from "slight" to "marked."

Cases of my own vary from a normal protein content to 0·15 per cent., and two had xanthochromia and one showed coagulation. My colleague, Sargent, has had cases showing a variation from normal to 0·2 per cent., two with xanthochromia, and one showed a coagulum. Sicard and Laplante report an increase of protein even as high as 0·55 per cent., while Bouché speaks of a "marked" increase in one of his cases.

Differential Diagnosis.

The conditions from which it is most difficult to diagnose meningitis serosa circumscripta are syringomyelia and intra- and extra-medullary tumour. Syringomyelia may be excluded by the presence of a true dissociated anæsthesia, joint affections, and vertebral deformities. Intramedullary tumours show a difference in levels for temperature and pain, and tend to show an upward progression of the sensory level. Also the saddle area—i.e., that supplied by the lower sacral segments—frequently shows a relatively slight sensory disturbance. An extramedullary or root tumour is characterised by the localised severe root pain associated with complete loss over that segment and a stationary upper level. In circumscribed meningitis the profoundness and character of the sensory disturbance at the upper level are more widespread than in spinal tumour. Further, the pain frequently affects more than one root and may be bilateral, thus giving the diffuse character to the pain referred to so often by various observers. Cases may show a broad band of hypoæsthesia over the trunk, while in the legs no sensory disturbance is to be made out. Yet a change in the reflex activity points to interference with the spinal tracts. The condition may be differentiated from plexus lesions by the fact that the symptomatology in the latter condition can be explained by a purely extraspinal lesion—in other words, there is a complete absence of pyramidal tract involvement and bladder disturbance.

In general terms it may be said that the most outstanding features in meningitis serosa circumscripta are the variability of the symptoms, the diffuseness of the pain, and the preponderance of subjective sensory over motor phenomena in the initial stage of the disease, while at a later stage the motor disturbances are more easily demonstrated than the sensory. As previously shown, examination of the cerebro-spinal fluid gives no assistance in diagnosis owing to the variability of the findings.

TREATMENT.

The treatment of meningitis serosa circumscripta is purely surgical. The aim of the operation is the division and removal of the proliferated and adherent arachnoid, the freeing of the roots and the cord within the theca, and the re-establishment of a free cerebro-spinal fluid circulation. The more definitely localised the lesion the more easily and the more completely can these results be attained. Failure to secure complete success is due probably to the widespread nature of the condition. One is not dealing therefore with a meningitis serosa cicumscripta but with a meningitis serosa diffusa. Unfortunately, there is no means of differentiating between these two types prior to operation.

The indications for operation are the same as for spinal tumour—viz., stationary symptoms not improved by other treatment, or progressive symptoms, in either case where a definite level has been established. An immediate operation may be called for in cervical cases with the onset of bulbar symptoms. The operative findings are always the same within the fairly wide limits of the pathological process. The theca is distended and shows no pulsation. The cerebro-spinal fluid is always under tension and on opening the dura either it escapes in a strong stream or its egress is interrupted by the œdematous arachnoid protruding into the incision in the form of a violet-grey shiny cyst. On the escape of the fluid pulsation usually returns, and this must be

regarded as strong presumptive evidence of the absence of a tumour. On widely opening the arachnoid localised cyst formation may be found with evidence of pressure on the cord, the roots may be encased in thickened arachnoid dragging upon and distorting the cord laterally, or the subarachnoid space may be completely obliterated at the site of the lesion.

Contrary to my own experience Mauss and Krüger describe a remarkable vascularity of the membranous processes. I have frequently seen tortuosity and engorgement of the veins and pallor of the cord, both suggestive of venous obstruction and interference with the vascular supply of the cord. The freeing of the cord and removal of the adherent processes produce at once a return to more normal vascular appearances, with disappearance of the venous distension and reappearance of the normal colour. Whatever the condition, it is dealt with *secundum artem* throughout the length of the operative exposure. It is well not to suture the dura on closing the wound with a view to preventing the formation of new adhesions. The muscles are closed in layers by interrupted catgut sutures.

The results of operations are in some cases brilliantly successful. The more localised the condition and the earlier the stage of the proliferative process the better chance of this result. Symptoms, even in cases primarily cured, may return in after years from a progression of the process at or about the same level or at one remote from it. Such has been my experience in one case. The widely diffuse process, involving the greater part of the cord or the cord at different and remote levels, is beyond the reach of operative approach.

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(*Continued at foot of next column.*)

CARBOHYDRATE TOLERANCE IN OVER-WEIGHT AND OBESITY.

BY R. S. ALLISON, M.D. BELF., M.R.C.P. LOND.,
PHYSICIAN, RUTHIN CASTLE.

THE following observations are based on a survey of 121 cases of overweight and obesity collected from the records of Duff House, Banff, and Ruthin Castle. In ascertaining the degree of overweight of a subject, reference has been made to tables[1] giving the average weights for all ages and heights. It is admitted that there must be considerable latitude of opinion as to what constitutes an average weight, and, whereas reliance has been more or less arbitrarily placed on these tables, yet no case which was only slightly above the average was included, but only those which were distinct, and who themselves, knowing what their average weight was, had admitted their obese condition and presented themselves for treatment for this cause alone, or on account of the glycosuria which in a few cases accompanied it. In this series the degree of overweight varied from 14 lb. to as much as 130 lb. above the average.

In the use of the terms overweight and obesity no difference other than one of degree is intended. Strouse and Dye,[2] however, draw a distinction between the terms, reserving overweight for those cases which result from overfeeding and sedentary habits. Obesity, though often the sequel of the same causes, in their view, may also arise in some instances without any excessive food intake or lessened expenditure of energy.

The cases in this series were all adults, 80 being within the age period of 40–60. In childhood and adolescence obesity is often associated with dysfunction of the endocrine glands, particularly the pituitary, and the same may be true to a lesser extent in adult life, when obesity is more frequently the result of extrinsic causes, such as overeating, combined with lack of adequate exercise. The scope of this paper is directed towards this class, so far as possible, cases of pituitary disease being excluded by clinical and laboratory means and by X ray examination of the skull. It is, of course, recognised that in many cases it is difficult to separate the exogenous types of obesity from the endogenous.

Occurrence of Glycosuria.—Sugar was present in the urine of 17 cases out of the 121, the amount varying from a trace to 22 g. in the 24 hours. Acidosis, as judged by the presence of acetone and diacetic acid in the urine, was absent in almost all, and when present was found in traces only. These cases were regarded clinically as mild diabetics. The remaining 104 showed no outward sign of a diabetic tendency.

Sugar-tolerance Tests.

The majority were treated before the blood-sugar curve was introduced as a means of testing carbohydrate tolerance. In 20 recent cases, however, such tests have been carried out. The technique employed was as follows: 60 g. of powdered cane sugar were given by the mouth at 9 A.M. on a fasting stomach, the last meal being about 7.30 on the preceding night. 0·2 c.cm. of blood was obtained by pricking the finger, before taking the sugar and at frequent intervals for three hours after. The bladder was emptied before the test and again at one, two, and three hours after. For the blood-sugar estimations the method of MacLean was used.

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Before proceeding to the consideration of abnormal results, it would be well to enunciate what normal, or standard, they are to be compared with. MacLean and de Wesselow[3 4] place the maximum rise of blood-sugar in health, after the ingestion of 50 g. of glucose, at 0·16–0·18 per cent., and require it to have returned to normal in one and a half hours. In infancy and up to the age of 3 years as shown by Spence,[5] the blood-sugar rises but slightly after a dose of sugar, and there is evidence to show that sugar tolerance decreases with advance of years. R. Hale-White and W. W. Payne[6] conclude that the fasting blood-sugar level lies below 0·12 per cent. for all ages. They point out that over the age of 70 the maximum rise in health may be up to 0·22 per cent., and suggest that for subjects under 30 the time taken to regain the fasting level should be extended to two hours and for those over 30 to three hours. C. D. Shapland,[7] using 60 g. of cane sugar, has found, in considering sugar-tolerance tests from ten healthy adults aged 20–40, that starting from a fasting level of 0·12 per cent. a maximum of 0·16–0·20 per cent. was obtained, a fair average being 0·17 per cent., and thereafter the resting level was regained in one and a half hours. In ten healthy adults aged 50–60 he found the average fasting level to be 0·13 per cent., the maximum blood-sugar 0·21 per cent., and the fall to resting level delayed to two hours.

For the purposes of this paper, a maximum rise of blood-sugar to 0·18 per cent. will be taken to represent the normal. In the accompanying diagrams of the results of sugar-tolerance tests on obese subjects, blood-sugar figures above this are shaded in black, to indicate clearly the area of hyperglycæmia in each case and to serve in comparing them with each other. The main features of the 20 cases are summarised in the tables shown. They are divided into two groups,

GROUP A.—*12 Cases Simple Obesity.*

Case.	Sex and age.	Duration of obesity.	Degree of overweight.	Daily urine.	After ingestion 60 g. sugar.			
					Fasting blood-sugar.	Max. rise of B.S.	Return to fasting level in	Urine during test.
		yrs.	lbs.		%	%	hrs.	
a	F 35	4	+62	N.	0·11	0·16	1½	N.
b	M 65	8	+75	„	0·11	0·18	1½	„
c	F 53	12	+50	„	0·14	0·18	1½	„
d	F 46	5	+67	„	0·13	0·20	2	„
e	M 36	8	+113	„	0·11	0·17	2½	„
f	M 54	20	+140	„	0·13	0·21	2½	„
g	F 50	5	+42	„	0·15	0·21	2	„
h	F 22	5	+120	„	0·13	0·20	Over 3	„
i	F 36	8	+60	„	0·14	0·24	2½	Tr. sug.
j	M 49	10	+125	„	0·15	0·25	Over 3	N.
k	M 46	5	+55	„	0·13	0·27	Over 3	Tr. sug.
l	F 64	20	+80	„	0·18	0·30	2½	„

GROUP B.—*8 Cases Obesity + Glycosuria.*

m	M 54	15	+48	2 g. sug. in 24 hrs.	0·13	0·26	2½	+ sug.
n	F 42	10–15	+39	Tr. sug.	0·11	0·26	Over 3	„
o	M 60	10–15	+43	14 g. sug. in 24 hrs.	0·16	0·26	Over 3	„
p	M 46	10–15	+29	15 g. sug. in 24 hrs.	0·11	0·27	Over 3	„
q	M 44	10	+60	Tr. sug.	0·17	0·29	3	„
r	F 58	6–10	+67	2 g. sug. in 24 hrs.	0·16	0·33	Over 3	„
s	F 40	12–15	+40	4 g. sug. in 24 hrs.	0·16	0·30	Over 3	„
t	F 43	20	+36	22 g. sug. in 24 hrs.	0·22	0·36	Over 3	„

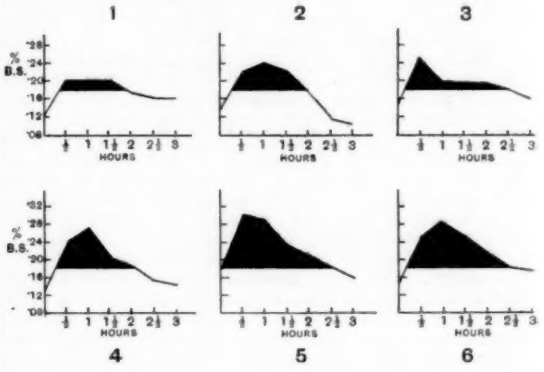
Sugar Tolerance.—Cases *a* to *e*, normal; *f*, *g*, slightly decreased; *h* to *n*, moderately decreased; *o* to *t*, much decreased. N., normal. Tr. sug., trace sugar.

group A, consisting of 12 cases of simple obesity whose daily urine was normal, and group B, consisting of 8 cases of obesity complicated by glycosuria—i.e., mild diabetics.

Features of Sugar-tolerance Tests in Groups A and B.

(A) *Simple Obesity.*—Sugar was found in the urine of three cases only of the 12 during the test. The fasting blood-sugar level was above 0·12 per cent. in nine cases, the maximum height above 0·20 per cent. in six, and the return to fasting level delayed to two and a half hours or more in seven.

Five of the cases showed a normal sugar tolerance, whereas of the remaining seven, two displayed a slight departure from the normal and five a moderate hyperglycæmia, evidence of decreased sugar tolerance. This is graphically represented in the diagrams Figs. 1, 2, 3, 4, 5, the shaded areas indicating the extent of the hyperglycæmia.



(B) *Obesity and Glycosuria.*—Abundant sugar occurred in the urine of all subjects during the test. From the table again, the fasting blood-sugar is seen to be above 0·12 per cent. in six cases, the maximum height above 0·20 per cent. in all eight, and the return to fasting level delayed to over three hours in six out of eight. There is less discrepancy between the individual members of this group than in the previous group A. Here not a proportion but all display a definite diabetic type. Fig. 6, representing a composite curve of the eight cases, is of the diabetic type, as shown by the extensive shaded area of hyperglycæmia provoked by the dose of sugar.

These results may now be summarised:—

Type.	Fasting level of blood-sugar.	Maximum rise after 60 g. sugar.	Return to fasting level in	Urine during test.
Normal.	0·09–0·12 %.	0·17–0·20 %.	2 hr.	Normal.
Obesity (Group A) (12 cases).	Above 0·12 % in 9 out of 12.	Above 0·20 % in 6 out of 12.	Delayed to 2½ hr. or more in 7 out of 12.	Contained sugar in 3 out of 12.
Obese diabetic (Group B) (8 cases).	Above 0·12 % in 6 out of 8.	Above 0·20 % in all.	Delayed to 2½ hr. or more in all.	Contained sugar in all.

Bearing of Results on Relation of Obesity to Diabetes.

The association of obesity and diabetes is well known. Diabetics frequently give a history of overweight preceding the onset of the disease. In an analysis of 1063 cases of diabetes, Joslin[8] states that obesity preceded the onset in 40 per cent. Root and Miles[9] place the percentage lower, at 20 per cent. In this series, examination of the urine showed glycosuria in but 14 per cent. or 17 out of 121 cases. The position in relation to diabetes of the remaining 104 remains in doubt until sugar-tolerance tests are applied.

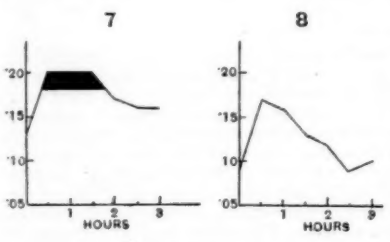
Sugar tolerance in adolescent cases of pituitary disease displaying obesity has been studied by Gardiner-Hill, Jones, and Forest-Smith.[10] These workers found in the early stage of the condition a decrease of carbohydrate tolerance, in the later an increase. The variety of obesity under discussion here—i.e., that of adult life arising from extrinsic causes—is very worthy of consideration, as it is

undoubtedly this type which is associated with the development of diabetes. It is only, therefore, what might be expected, when in many cases sugar-tolerance tests reveal a well marked diabetic tendency or decreased ability to deal with carbohydrate. No hard-and-fast rule need be drawn between what is a normal and what is an abnormal curve. If the 20 cases, on which sugar tolerance tests were performed, are placed in the order of the degree of hyperglycæmia, they are seen to pass by gradual stages from the undoubtedly normal to the as surely diabetic type. Labbé and Boulin[11], giving 50 g. of glucose to obese subjects, have demonstrated similar results and supported the view long held that a certain proportion of the obese are in danger of becoming diabetic.

From a survey of the varying results obtained by examination of the 20 cases, it is obvious that the diabetic tendency is not present in every case, and varies in degree when it is present. It is likely, therefore, that there are factors at work which render one case more likely to develop diabetes than another. These may now be discussed.

Possible Factors Disposing to a Diabetic Tendency in the Obese.

1. *Effect of Reduction of Weight on Sugar Tolerance.*—It is a general observation that in diabetic subjects who are over weight, reduction of weight, even if only of a few pounds, leads to improvement of sugar tolerance. This is, of course, the foundation of the fasting treatment of diabetes, the reduction of food sparing the pancreas. If the decreased sugar tolerance shown by many of the above cases is in any way connected with their obesity, a similar result should follow reduction of their weight. In Case *h* (Fig. 7), whose weight was 17 st. 2 lb. in 1925, a sugar-tolerance test gave a curve tending to the diabetic type. Under dietetic treatment weight was reduced to 13 st. 13 lb. (loss of 3 st. approximately). A sugar-tolerance test was again performed nine months later under the same conditions and by the same observers, and gave a normal type of curve (Figs. 7 and 8). This could not be due to immediate effects of the diet, and it would seem that, in this case, permanent reduction of weight had benefited sugar tolerance. In another case seen since, and not included in the above, reduction of weight resulted in improved tolerance. It seems reasonable to suppose, therefore, that the obesity is directly connected with the decreased sugar tolerance shown by many of these cases.



2. *Degree of Overweight.*—Joslin[8] has said that diabetes is the penalty of obesity, and that the greater the obesity the more likely is nature to enforce it. It seems indeed likely that the greater the degree of overweight the more would the sugar-tolerance test show a departure from the normal. The experience in this series is not, however, in agreement with this view. There appears to be no relationship between the extent of the obesity and diabetic tendency. If the sugar-tolerance curves of the 20 cases are placed in their ascending order of overweight, no corresponding uniform decrease in sugar tolerance is seen. One case, 140 lb. over average weight, showed only a slight departure from the normal, whereas another, 55 lb. over the average (Case *k*, Fig. 3), shows a diabetic type of curve.

3. *Age.*—The effect of age on sugar tolerance has already been referred to, and on this ground it might well be argued that the type of curve seen in the obesity of middle life may not be due to the obesity, but to the age of the patient. Figs. 1, 2, 3, 4, 5 are curves which cannot be explained on grounds of age alone. Furthermore, the workers above mentioned [6 7] have not stated whether their subjects were over weight or not, but merely that they were healthy individuals.

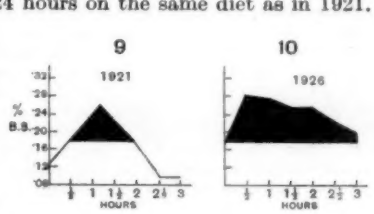
4. *Hypertension and Hyperglycæmia.*—Mohler[12] describes cases in middle life showing the syndrome of hypertension, hyperglycæmia, obesity, and arterio-sclerosis, obesity being said to favour the development of arterio-sclerosis and high blood pressure. In only three of the 20 cases was the systolic blood pressure above 160 mm. of mercury, so that the question whether high blood pressure and not obesity has to do with decreased sugar tolerance does not arise in this series.

5. *Duration of Obesity.*—Referring back to the tables, groups A and B, the duration of the obesity is stated for each case. In nine it is under 10 years and in 11 cases of 10 years' duration or more. It is interesting to compare the results of sugar-tolerance tests for these two periods of time:—

Sugar tolerance.	Under ten years' duration (9 cases).	Ten years' duration or over (11 cases).
Normal	4	1
Slightly decreased ..	1	1
Moderately decreased ..	4	9

The periods of time stated are, of course, approximate only, and the total number of cases small to draw conclusions from, but the relatively large number of diabetic curves obtained from cases of obesity of long-standing is noteworthy.

More evidence is found in Case *m* (Fig. 6). This patient was first admitted to Duff House in 1916. His weight then was 16 st., height 6 ft. There was a trace of sugar in the urine. In 1921 a sugar-tolerance test gave the result shown in Fig. 9. He was then passing 2 g. sugar in the 24 hours. No serious effort was made on the part of the patient to reduce weight which fluctuated between 16 and 17 st., until readmission in 1926, when he was found to be passing 58 g. of sugar in the 24 hours on the same diet as in 1921. A sugar-tolerance test was repeated and gave the results shown in Fig. 10.



It is obvious that a considerable further decrease in sugar tolerance has taken place since 1921, and this cannot be attributed entirely to his increase of age from 54 to 60. It would seem reasonable to suppose, therefore, that it is the length of time the obesity has continued unchecked which influences the tendency to diabetes. It is of interest to note that the French observers already mentioned favour this view.

Ætiology of Decreased Sugar Tolerance in Obesity.

If we admit that many cases of obesity, particularly those of long standing, display a decreased carbohydrate tolerance, it remains to discuss the possible genesis of the condition. In the normal adult, the body-weight undergoes but slight fluctuation; the process of anabolism, resulting from the intake of foodstuffs more or less balancing catabolism from the expenditure of energy.

In the type of obese subject under consideration, conditions favouring excessive anabolism and interference with this balance are present. The simplest example is that of the person who lives too well and takes inadequate exercise. This process once begun will continue, for the more abundant and rich the food

the less will be the desire for physical exercise. Further, the stouter and more spherical the subject, the less food per kilogramme is required for body purposes. A time will come when the individual limit of storage is reached, and then, or in all probability before then, the storage mechanism will default, giving rise to excessive accumulation of sugar in the blood, with leakage into the urine. This stage is represented by the "fat" diabetes class. The quantity of sugar in the urine of these cases was never great, and urine rarely showed indications of the incomplete combustion of fat in the presence of acetone bodies. It would, therefore, seem likely that the internal pancreatic secretion of these cases was not greatly affected.

During the years of gradual increase of weight the pancreas has been called upon to deal with excessive amounts of carbohydrate. As shown by Allen,[13] a condition of hyperglycæmia is detrimental to the internal secretory tissue of the pancreas. As a result some deterioration of the insulin secretion might be expected. Individual susceptibility may explain why a few cases proceed to a further stage with rapid wasting and signs of severe diabetes. The majority of obese subjects, however, apparently remain at this stage, revealing their diabetic tendency only when examined by sugar-tolerance tests. A small number pass to the "fat" diabetes type and a few only to severe diabetes.

Summary.

1. The above observations are based on a survey of 121 cases of obesity, occurring in adult life and arising from extrinsic causes, such as overeating, lack of adequate exercise, or a combination of both. So far as possible cases of endocrine disturbance have been excluded.

2. An attempt has been made to study carbohydrate tolerance in this type of obesity and to inquire into the relationship which is known to exist between obesity and diabetes.

3. Glycosuria was present in 17 cases only, or in 14 per cent. The remaining 104 were sugar free, and showed no outward sign of a diabetic tendency.

4. Sugar-tolerance tests were performed in 20 instances, including eight of those who were known to have glycosuria. From a review of these it would appear that, though some individuals much over weight have a normal sugar tolerance, many display a partial inability to deal with carbohydrate, and especially those who are known to have glycosuria.

5. In those who show decreased sugar tolerance, an improvement in tolerance, or even a return to normal, may take place if weight is reduced.

6. There is evidence to prove that the decreased carbohydrate tolerance is dependent on the length of time the obesity has existed unchecked.

In conclusion I desire to express my sincere thanks to Dr. E. I. Spriggs for much valuable help and criticism and to my colleagues, A. J. Leigh, J. S. Jeffery, and T. J. Dobie, by whom the blood-sugar estimations were carried out in the Ruthin Castle laboratories.

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REMOVAL OF THE METATARSAL HEAD

FOR HALLUX VALGUS AND HALLUX RIGIDUS.*

BY GEORGE PERKINS, M.CH. OXF., F.R.C.S. ENG.,

ASSISTANT SURGEON TO THE ROYAL NATIONAL ORTHOPÆDIC HOSPITAL; ORTHOPÆDIC REGISTRAR, ST. THOMAS'S HOSPITAL.

I HAVE recently examined more than 50 patients operated upon for hallux valgus or hallux rigidus in the orthopædic department at St. Thomas's Hospital during the five-year period 1921 to 1925.

The operation is a standard one. A straight dorsal skin incision is used. The head of the metatarsal is excised at the level of the neck, thus removing half an inch or more of the bone. A plain vertical surface of raw bone is left; protruding spikes of bone are removed, and the edges are bevelled. The phalanx is not touched. The sesamoids are left intact, and no tendons are interfered with. As a rule the bursa is not dissected out and removed. No material is interposed between the raw end of the matatarsal and the phalanx. No splint is used afterwards. Ten days after the operation the stitches are taken out, and the patient gets up in a large sized shoe. He is treated daily for a week or so with faradic foot baths, and is fitted either with an anterior arch support, or else with a platform made of felt or sponge rubber, running from the heel to just behind the heads of the metatarsals.

Results.

From the patient's point of view.—The results of this operation, as of many surgical procedures, are judged differently by the patient and by the surgeon. The vast majority of patients are immensely pleased. Only two out of the 50 were doubtful whether they had derived any benefit. Most of the patients before the operation were prevented from working owing to pain. All of them are now at work of varying kinds, as shopmen, policemen, porters, domestic servants, gardeners, &c. They one and all declared that there was no longer any pain in the big toe joint. Some, however, complained of pain in the other toes and under the outer side of the forepart of the foot. A few remarked that they could not get the big toe on the ground, although they did not complain about it.

From the surgeon's point of view the results are as follows: In every patient the severe valgus deformity had disappeared, the big toe might deviate slightly towards the other toes but in most cases it was straight. The big toe was usually shorter than the second toe after the operation and possibly this was a factor in retaining the big toe in its straight position. The bunion always disappeared as a result of the operation, and this happened in spite of the fact that the bursa was rarely ever touched at the time of the operation. As regards the position of the big toe, in 75 per cent. of patients there was a slight amount of permanent dorsiflexion so that the big toe did not come down on to the ground. The average range of movement was 15 degrees. Although there was no relationship between the amount of power in the big toe and the amount of movement, the arc of movement did seem to influence; if the big toe was permanently dorsiflexed the power was feeble, while if the big toe touched the ground there was always considerable power. My impression is that the best arc of movement is from 5 degrees of plantar flexion to 10 degrees of dorsiflexion; 10 degrees of dorsiflexion seemed ample for every purpose of the big toe. Our custom has been to bandage the big toe into dorsiflexion after operation to ensure that it should be dorsiflexed; in my opinion it would be better to aim for a straight position. The range of movement, whether small or large, was invariably painless.

* A paper read before the British Orthopædic Association.

Cause and Relief of Metatarsalgia.

A certain number of patients complained of pain in the other toes or under the heads of the metatarsals. Unfortunately, owing to insufficient data, I do not know how many of these patients were suffering from metatarsalgia prior to the operation. Judging from observations on recent cases not included in this review, I should estimate the number at 50 per cent.

Although metatarsalgia is popularly supposed to be due to a dropping of the anterior arch, I find myself in sympathy with those surgeons who attach little importance to the anterior arch. Certain it is that a flat anterior arch may be symptomless. In my opinion, metatarsalgia and a flat anterior arch are associated, because with a flat anterior arch there often is a fixed dorsiflexion of the metatarso-phalangeal joints of the toes, and it is the limitation of plantar flexion at these joints that causes the metatarsalgia. A brief explanation will make this clear. When a person takes a step forward, his leg muscles have to lift the body off the ground and propel it forward. This can be done in two ways. If the ankle, tarsal, and metatarso-phalangeal joints are held stiff, the calf muscles (particularly the toe flexors) supply the power and the fulcrum is formed by the toes pressing down on the ground. If the metatarso-phalangeal joints cannot be held stiff or are dorsiflexed, the toes can no longer act as the fulcrum of the movement and the fulcrum is shifted back to the heads of the metatarsals. The heads of the metatarsals are not intended by nature to act as a fulcrum for the propulsion of the body, and if they are so used, there results the formation of callosities on the skin under the heads of the metatarsals and an irritative arthritis of the metatarso-phalangeal joints—the syndrome known as metatarsalgia. By the term "metatarsalgia" I do not refer to the pathological condition associated with the name of Morton. I employ it as a useful, indefinite term, in the literal sense—viz., pain in the neighbourhood of the metatarsals.

The essence of the treatment of metatarsalgia consists in restoring the fulcrum from the heads of the metatarsals to the toes, and hence one's aim is to increase the range of passive plantar flexion at the metatarso-phalangeal joints by manipulations and to improve the power of active plantar flexion by strengthening the plantar flexors. On this hypothesis the metatarsalgia existing prior to the operation is due to lack of toe plantar flexion, and the operation renders the condition worse because it often abolishes the power of plantar flexion of the big toe-joint.

The review of the results of the operation for hallux valgus supports this hypothesis. In patients with toes that were either clawed or rigid, metatarsalgia was the rule; in some of these the wearing of an anterior arch support, a concealed metatarsal bar, or a felt platform relieves the symptoms. In patients with straight and mobile toes the support could be, and often was, dispensed with. The less the big toe was dorsiflexed, the greater was the power in the big toe and the less frequent was the metatarsalgia.

Considering that metatarsalgia is often present with hallux valgus or rigidus, it would seem advisable to treat the condition at the same time as the valgus; and I would suggest that as a routine before the patient leaves the operating table the inter-phalangeal joints should be forcibly straightened, and the metatarso-phalangeal joints should be forcibly plantar flexed—after tenotomy of the extensor tendons if necessary—and maintained in that position by means of a slab of plaster-of-Paris which could be removed on the tenth day when the stitches are taken out. Then the masseuse will take care to preserve the power of plantar flexion at the metatarso-phalangeal joints, and to strengthen the interossei muscles by faradism and exercises.

Age in Relation to Operation.

The age of the patients operated upon varied between 16 and 74. The most successful operations were those done on patients below the age of 20. Six patients under that age were operated on; one plays tennis and walks any distance, the second walks 20 miles a day, one is a domestic servant on her feet all day long, another is a salesman in a shop from 8 A.M. to 6 P.M., and the sixth goes in for sprint races and has won prizes for long distance running. This is contrary to the usual belief that operations during the growing period are inadvisable, and certainly for this reason these patients would not have been operated upon unless their symptoms had been severe and resistant to palliative measures. Five suffered from hallux valgus and one from hallux rigidus. Whether the operation is done for rigidus or for valgus does not seem to affect prognosis.

Summary.

To sum up, the operation of excision of the head of the metatarsal can be relied on always and completely to cure symptoms due to hallux valgus and to hallux rigidus. It does not relieve metatarsalgia—in fact, it often makes it worse. And it is suggested that the existing metatarsalgia should be treated at the time of the operation by straightening the toes and plantar-flexing the metatarso-phalangeal joints, and that further metatarsalgia be avoided by ensuring that the arc of movement of the big toe after the operation is the ideal one—i.e., from 5 degrees of plantar flexion to 10 degrees of dorsiflexion.

FOUR CASES OF SPONTANEOUS SUBARACHNOID HÆMORRHAGE.

BY HUGH BARBER, M.D., M.R.C.P. LOND.,
HONORARY PHYSICIAN, DERBYSHIRE ROYAL INFIRMARY;
AND
H. C. C. TAYLOR, M.B., B.S. LOND.,
HOUSE PHYSICIAN TO THE INFIRMARY.

IT is difficult sometimes to decide whether a disease is occurring more frequently or whether it is being recognised more commonly. During six months four cases of spontaneous subarachnoid hæmorrhage were admitted to the Derbyshire Royal Infirmary. The publication of several recent papers has encouraged us to put this series on record.

The Clinical Picture.

The signs and symptoms on admission have conformed to a typical text-book description.[1] The clinical picture has been that of cerebral compression and meningeal irritation combined, sometimes the one and sometimes the other preponderating, very similar to a case of meningitis where drowsiness, tending towards coma, is associated with irritability on examination. The symptoms of headache, vomiting, stiffness of the neck, and some rigidity of the limbs have been present in every case. But the temperature has been normal in the first day or two and the onset quite sudden, as one would expect in a vascular lesion. Case 1 was in bed with headache and stiff neck 15 days before admission, but developed a sudden collapse with loss of consciousness after getting out of bed. The others were prostrated as rapidly as a case of apoplexy. No cranial nerve palsies were observed, but some degree of retinal change was present in two cases; the most striking one showed very definite hæmorrhages. Lumbar puncture in all four cases revealed cerebro-spinal fluid under pressure which was deeply coloured with blood. When allowed to settle there was some coloration in the upper part of the fluid, showing that the blood was not an accidental contamination. No organisms could be obtained. When coma was pronounced lumbar puncture relieved the condition, and all four patients made steady but variable progress towards recovery. After a further rest in bed they were discharged without any serious symptoms remaining. Glycosuria was not present;

but the two elderly patients had albuminuria, which cleared up eventually. Herpes zoster has been described in this condition,[2] but was not present in our cases.

Diagnosis.

The diagnosis is suggested by the sudden onset of the symptoms of cerebral compression associated with irritability on examination and other signs of meningeal irritation such as headache and neck rigidity. In one of our patients (Case 1) there would appear to have been some oozing, leading to neck rigidity, some days before free hæmorrhage occurred. The blood-stained cerebro-spinal fluid is quite characteristic, showing after standing a tinted supernatant fluid. In all our cases it was obvious and quite typical when taken immediately or a few days after the onset of the symptoms. Cerebro-spinal fluid withdrawn later on showed excess of leucocytes without red cells, which might have suggested meningitis if the earlier lumbar puncture had been omitted. Collier[4] points out that this is explained by the fact that the red cells have disintegrated and the leucocytes have remained; he states that a differential count will demonstrate that the cells are in the same proportion as in a count of the blood. Some pyrexia may be present as in all cases of hæmorrhage into a serous cavity, but it develops after the onset in contrast to meningitis.

Although herpes facialis is common in meningitis, herpes zoster does not occur; and Adie regards this latter, if present, as a valuable aid in the diagnosis of subarachnoid hæmorrhage.[2] A large and rapidly fatal subarachnoid hæmorrhage is indistinguishable from a cerebral hæmorrhage which has ruptured into the ventricles; but this type of case is of pathological rather than clinical interest.

Prognosis.

From our own cases, all of whom recovered, and others recently recorded, the immediate prognosis would appear to be fairly favourable. Six months after the illness three of our patients have resumed their normal life, with occasional headache in the two elder ones. Case 4 did not have so long a rest in bed, and although getting about has not progressed so well. Symonds says the attacks tend to recur, and quotes a case of recovery in which two previous attacks had been diagnosed as meningitis.[1] The recording and following up of such cases as ours should furnish knowledge from this point of view.

Ætiology.

Hæmorrhage into the subarachnoid space in such conditions as diseases of the blood and infective endocarditis does not concern us. In spontaneous cases, two underlying pathological conditions have been found. Hæmorrhage may occur as the result of atheroma of the cerebral arteries; but in many cases it comes from the rupture of a congenital aneurysm which is not easy to demonstrate but is not uncommon around the circle of Willis.[1] Our own cases, judged by their age, would suggest that two were due to congenital aneurysm and two to atheroma. Symonds says syphilis is not a common cause. Three of our patients were tested with negative Wassermann result. The exciting cause of an attack might come up for discussion in a case of compensation; but it would not appear that any severe effort or injury is needed when the underlying pathological condition is present. One of our cases was attributed by the patient's wife to a vigorous blowing of the nose.

Treatment.

Rest in bed, prolonged for some weeks after symptoms have subsided, is the main indication. We did not use any drugs in our cases. Lumbar puncture is indicated for increasing signs of compression and relieves the symptoms and danger. On the contrary, where cerebral irritation is severe, it is difficult to perform and might do harm; moreover, some amount of increased pressure may tend to stop the bleeding.

Notes of the Cases.

CASE 1.—L. W., female, aged 52 years. Nov. 13th, 1925: Sudden severe frontal headache with stiffness of neck—patient was dazed and her speech thick—symptoms improved in bed and she got up on the 25th. Headache returned on the 28th, and patient collapsed in lavatory; she was picked up unconscious.

On admission to Derbyshire Royal Infirmary she was comatose. Temperature 97° F., pulse 47, very collapsed; two hours later she was drowsy, very irritable, with rigidity of neck, and vomiting frequently, pupils equal, regular, and reacted sluggishly to light, no paralyses, slight optic neuritis with several large hæmorrhages on the fundus, heart and lungs normal, blood pressure (systolic) 150 mm. Hg; urine contained albumin, no sugar. Vomiting was frequent for 24 hours as consciousness gradually returned. Nov. 30th: Perfectly intelligent, headache and neck rigidity still present. Lumbar puncture yielded 25 c.cm. of fluid, which contained much blood but no micro-organisms. From then onwards recovery appeared complete. On Dec. 7th the cerebro-spinal fluid contained 35 cells per c.mm., which were mixed polymorphs and lymphocytes. On Dec. 21st it contained eight lymphocytes per c.mm. The Wassermann reaction was negative in blood and cerebro-spinal fluid.

Sept. 11th, 1926: Patient active and well, but complains of headache when she is overtired. Mental condition is perfect.

CASE 2.—S. B., female, aged 59 years. March 17th, 1926: Sudden frontal headache with gradual loss of consciousness.

On admission to the infirmary ten hours later she was comatose, with neck rigidity and Kernig's sign positive on both sides. Temperature 97° F., pulse 80. The pupils were equal, regular, and reacted sluggishly to light; the plantar reflexes were both flexor. Heart and lungs normal; urine contained albumin; optic discs normal. March 19th: Drowsy, irritable, and complained of frontal headache; neck still rigid and occasional vomiting. On lumbar puncture 30 c.cm. of deeply blood-stained fluid was withdrawn, containing no micro-organisms. April 10th: Full consciousness and muscular power returned gradually, neck rigidity being the last sign to disappear.

Sept. 9th: Patient well and getting about; still has occasional lapses of memory and frontal headache.

CASE 3.—E. S., male, aged 13 years. Jan. 3rd, 1926: Sudden occipital headache while walking in street; walked 100 yards home and lay down. He never lost consciousness, headache was severe and continuous, and vomiting frequent for 36 hours.

On admission to the infirmary on Jan. 6th patient was drowsy and irritable and complained of violent pain in the back of his head. Temperature 99·4° F., pulse 60, neck rigid and head retracted, Kernig's sign positive on both sides, no other signs in nervous system. Heart and lungs, optic discs, and urine normal. On lumbar puncture 35 c.cm. of blood-stained fluid were withdrawn, with temporary relief of headache. Examination of the fluid for organisms was negative. To relieve the headache, which was very severe, lumbar puncture was repeated daily for five days, and thereafter less frequently. The blood gradually disappeared from the cerebro-spinal fluid, and on the 30th normal fluid was obtained with a cell count of four lymphocytes per c.mm. Recovery appeared complete, the headache lasting for some days after the neck rigidity had cleared up.

Sept. 9th: Patient feels perfectly fit, is doing light work, and has had no return of headache. Mental condition normal, no physical signs in heart, chest, or nervous system; optic discs normal. Systolic blood pressure 130 mm. Hg; blood Wassermann reaction negative.

CASE 4.—A. S., male, aged 33 years. May 16th, 1926 Complained of sudden slight pain in neck while taking a meal; half an hour later, on blowing his nose, fell unconscious. He recovered consciousness partly in a few hours, and remained drowsy, vomiting frequently, and shouting with pain in his forehead for three days.

On admission to the infirmary on May 20th patient was drowsy and irritable, and complained of frontal headache. Temperature 99·4° F., pulse 76. Neck rigid, Kernig's sign positive, and extensor plantar responses on both sides; pupils normal; no signs in chest and heart; urine normal, slight optic neuritis. Lumbar puncture yielded 8 c.cm. of blood-stained fluid not under pressure; examination of the fluid for organisms was negative. Full consciousness returned gradually without further vomiting. May 22nd: Headache still severe. On lumbar puncture 25 c.cm. of blood-stained fluid were withdrawn under pressure. Headache relieved and did not return. Recovery apparently complete, the neck rigidity disappearing last. Blood Wassermann reaction negative.

Sept. 9th: Patient still has occipital headache brought on by exertion, and has not returned to work. No physical

signs in heart, lungs, or nervous system; optic discs normal, systolic blood pressure 135 mm. Hg.

We are indebted to Dr. A. D. Hunt for permission to publish Case 3.

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Clinical and Laboratory Notes.

A CASE OF MUMPS ENCEPHALITIS.

BY HARRY BEDINGFIELD, D.S.O., M.B., CH.B.EDIN., M.R.C.P.LOND.

REPORTS of mumps encephalitis are sufficiently rare to justify the publication of the following case.

On Dec. 23rd, 1925, a previously healthy boy, aged 5 years, while Christmas shopping with his mother, complained of the sudden onset of pain in his legs sufficiently severe to prevent him from walking and necessitating his immediate return home by taxi-cab. He was seen by me an hour later and found to have a temperature 104° F., pulse-rate 80, and respirations 25. His right knee was slightly swollen, and both knees and tibiæ painful and tender. There were no other physical signs to be detected. On the 24th temperature was normal, and the swelling of the knee had disappeared, but he complained of tenderness of the extensor thigh muscles. No further physical signs had appeared yet the child looked ill, was somewhat dull mentally, and refused food. In the evening, with a rise in temperature, all pain disappeared. On Christmas Day his condition was the same until the afternoon, when I was hurriedly called to see him as he was said to have "collapsed." I found him with a barely perceptible pulse, feeble respiration, and semi-comatose, only answering after repeated questioning. Two hours later this state had completely passed. On the 26th his condition remained the same, "collapsing" each afternoon and rallying in the evening. From the onset of his illness he was obstinately constipated, refused all food, and vomited any nourishment that was forced upon him. A blood-count revealed a leucocytosis of 12,000 with polymorphonuclears 85 per cent. On the morning of the 28th he was so severely collapsed that the parents believed him to be dead, but he rallied in about an hour. He then complained of pain and tenderness in the epigastrium. For the first time a few rhonchi and scattered crepitations appeared in both lower lobes of his lungs. In the afternoon I found him presenting a most striking picture. Propped up in bed as if intensely dyspnœic, he had an area of intense pallor around his nose and mouth, with a deeply flushed face and neck. The epigastrium was firmly retracted and there were no respiratory movements of his lower ribs. Examination of his chest revealed a definite early broncho-pneumonia of the left lower lobe with respirations 40. The whole appearance of the child was that of being in intense pain although complaining of none. Dr. C. W. Vining saw the boy in consultation with me and neither of us could suggest an explanation of his condition. It was decided to give him a hypodermic injection of morphine (gr. 1/12) and await events. Three hours later the child was quite unconscious, lying on his side, head retracted, both arms rigidly extended at the shoulders, pronated and flexed at the wrists and fingers, both lower limbs were hyperextended, and his feet plantar flexed. Two hours later Dr. Vining saw him again with me when the rigidity had passed off sufficiently to perform a lumbar puncture. There was no increase in the pressure of cerebro-spinal fluid which was perfectly clear. The child appeared to be so seriously ill that we concurred in giving the gravest prognosis. He was given a full dose of anti-pneumococcal serum in the belief that he was suffering from a pneumococcal septicæmia. On the 29th the child was still alive. Extensor spasm had completely passed, and he lay curled up as if in a state of cerebral irritation with a relaxed open mouth and widely dilated pupils which still reacted to a strong light. Ophthalmoscopic examination showed dilatation of the retinal veins, no tendon reflexes could be elicited, and there was a positive Babinski. The abdomen was protuberant and reflexes absent. There was incontinence of urine and fæces. Notwithstanding skilled nursing, reddening of pressure points appeared with extreme rapidity, and the skin round the lumbar puncture began to slough. Unfortunately, the pathologist reported that the cerebro-spinal fluid had been contaminated by blood, but he was of opinion that there was an intense lymphocytosis present. A blood-count, however, showed the polymorphonuclear leucocytosis was still present. On the 30th his condition was much the same, except for paresis of his right external rectus and the development of a distressingly frequent cerebral cry. On the 31st he suddenly regained consciousness at 7 A.M. and feebly asked for something to eat. However, he immediately relapsed and did not regain consciousness again until 11 A.M. I saw him shortly after and he was then lying on his back with a Parkinsonian face and a pronounced external paresis of his eye muscle. I concluded he was suffering from encephalitis lethargica. He regained control of his bowel but had passed no urine since the night before, and his bladder was empty. On Jan. 1st, 1926, he still had anuria. Myoclonic movements appeared in his neck, extensor thigh, and abdominal muscles. On the 2nd he took some food and passed urine for the first time for 72 hours. In the evening both parotids became swollen, and a septic parotitis was diagnosed. On the 3rd myoclonus and paresis of his rectus had passed away, but the child now seemed to be gravely ill with broncho-pneumonia. On the 4th I was called to see a neighbour's boy whom I found to be suffering from mumps. I was then informed that this child had been in contact with no other child but my patient a fortnight previously. I now suspected that the case I am reporting was one of mumps with cerebral symptoms appearing before the parotid swelling. From the 2nd to 10th his chest condition slowly improved. On the 11th parotids began to subside and by the 16th the chest was clear. The child was well except for the extreme weakness of having passed through a severe illness. He has been seen by me at intervals. Over a year has now elapsed without the development of any sequelæ. The boy is a healthy robust child, normal in all respects both mentally and physically, which seems to rule out any possibility of his attack being one of encephalitis lethargica.

Although the first recorded case of cerebral manifestations in mumps is said to have been reported in England by Hamilton, there has been little attention paid to this aspect of the disease in English medical literature. Maximovitch, who reported the first post-mortem examination of a case dying from cerebral manifestations, found œdema of the brain surface, the sulci filled with a semi-fibrinous exudate, and hyperæmia of the pons and spinal cord. Lannois and Lemoine were the first to suggest that the cerebral manifestations were due to a true meningo-encephalitis. Acker, in 1913, was able to collect 30 fatal cases up to that time and reported two of his own in both of which he found a meningo-encephalitis at the base of the brain. During the war numerous reported cases were published by Haden, Casparis, Howard, and Larkin from the American armies, and by Micheleau, Fiessinger, de Massany, and Sainton from the French. In all these reported cases the cerebral manifestations appeared after the parotitis. I can only find one case in the literature where they appeared before—namely, that reported by Colomb and Mercier of a soldier who was found comatose in his barrack-room with dilated pupils, stiff neck, and a positive Kernig sign. He remained in coma for three days, after which his temperature and pulse-rate fell and a double parotitis appeared. In the other cases where cerebral symptoms have been reported prior to the parotitis, these symptoms have been so slight or of such short duration that they could be well explained by the pyrexia. In none of them did they last longer than a few hours.

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A CASE OF GONOCOCCAL ARTHRITIS,

WITH PATHOLOGICAL DISLOCATION OF THE HIP-JOINT.

BY E. H. SCHWAB, M.D., B.S. LOND.,
ASSISTANT MEDICAL OFFICER, FEMALE V.D. DEPARTMENT, GUY'S HOSPITAL.

THE following case of pathological dislocation seems to deserve record.

A.B., a single girl, aged 19, was admitted to Guy's Hospital on Sept. 3rd, 1924, with a history of three to four months' vaginal discharge, for which she had received no treatment. She had suffered from pain in the left hip for two months, and had been treated by rest in bed, and the application of a splint. There was no history of injury to the hip. The hip had become gradually worse, the least movement causing intense pain. The discharge had persisted, but was not very profuse.

Condition on Admission.—The patient showed signs of a typical upward dislocation of the left hip. Her general condition was not good. The temperature varied between 99° and 100° F., and her pulse averaged 110. On examination of the vulva, marked urethritis with inflammation of the Skene's and para-urethral ducts was discovered. The cervix was found to be comparatively healthy, and it seemed that the chief site of infection was in the urethra and the ducts. No gonococci were found in the first set of films taken from the urethra and cervix. Cultures from the urethra grew *Staphylococcus albus* and *aureus*. No pus cells nor gonococci were found in a catheter specimen of urine. A skiagram of the left hip showed dislocation upwards and much erosion of the head of the femur.

An anæsthetic was administered and a Thomas hip splint with overhead extension was applied to the left hip. Local treatment for the discharge and urethritis was begun immediately.

After a few days the patient complained of pain in the right knee, which was found to be considerably swollen, with much limitation of movement. The X ray report was as follows: "Irregular rarefaction of articular extremities suggestive of infective arthritis. No erosion of articular surface nor (apparently) of the cartilage." A week later the patient complained of pain and tenderness in the right loin. She appeared extremely ill. There was vomiting and hæmaturia. She seemed collapsed after passing blood in the urine; temp. 102·8°, pulse 120. Much blood was present in the urine; some specimens apparently consisting of almost pure blood. This condition persisted for three days, when the urine was again free from albumin and blood. Pathological report on the urine: Two specimens were examined. The clear specimen showed a few red cells, and pus also and some indefinite renal casts. Albumin, say 0·5 per cent. The hæmaturic specimen contained much blood and albumin in excess of the blood. No pus or casts were seen.

Films from the urethra now showed the presence of gonococci. Cultures again grew *Staphylococcus albus*. The urine examined later contained pus, *Staphylococcus albus*, and *Streptococcus brevis*, but no gonococci. A month after the application of the extension apparatus the X ray report was: "No dislocation now. Infective arthritis with extensive erosion of the articular cartilage and of the underlying bone."

There was gradual improvement in the condition of the hip, and by the end of the year the patient was able to walk well with crutches. The Thomas's splint had been replaced by a walking calliper with boot. The signs of arthritis in the right knee had completely disappeared. The vulvo-vaginal condition was much improved; only a slight mucoid discharge from the cervix and the para-urethral ducts persisting. Films showed a few pus cells but no gonococci. The patient was discharged from the ward and able to attend the out-patient clinic for treatment at the end of January, 1925.

Treatment.—On admission, local applications of protargol bougies to the urethra and protargol pessaries to the vagina twice daily: also a daily intramuscular injection of 1 c.cm. of collosal manganese was given—about 15 doses in all. Later these were replaced by collosal iodine, 10 c.cm. every third day. A mixture containing sandal oil and tincture of hyoscyamus was given by the mouth. One dose of gonococcal vaccine (½ million) was given, but not repeated, because it was thought that perhaps the vaccine was the cause of the sudden exacerbation in the kidney.

Whilst attending as an out-patient the cervix and urethra were swabbed at intervals with protargol and glycerine. The patient had regular massage and was soon able to get about without a splint. The hip became ankylosed and the left knee was stiff from disuse. Manipulations of the left hip and knee were carried out under anæsthesia on two occasions. The X ray report on the condition in December, 1925, was: "Hip: old infective arthritis of hip-joint. Bony ankylosis. No evidence of activity. Knee: No evidence of disease. Some degree of atrophy probably due to disuse."

The patient attended occasionally during 1926, reporting herself well each time. Films taken from the cervix and urethra at each visit were free from gonococci. In September, 1926, she was discharged as cured. The local condition appeared normal. She walked extremely well with her ankylosed hip, and the knee could be flexed to almost a right angle. Since then she has married, and is keeping perfectly well. She can walk nearly a mile without feeling tired.

My thanks are extended to Dr. Morna Rawlins and Mr. V. Lloyd, and to Mr. W. H. Trethowan for kind permission to publish this case.

A CASE OF METASTATIC CARCINOMA OF THE CHOROID.

BY ROY THOMAS, M.B., F.R.C.S. EDIN., D.O.M.S. LOND.,
ASSISTANT OPHTHALMIC SURGEON TO THE SWANSEA GENERAL AND EYE HOSPITAL;
AND
A. F. SLADDEN, D.M. OXF.,
PATHOLOGIST TO THE HOSPITAL.

CARCINOMA of the choroid is, perhaps, uncommon enough to justify the recording of the following case of bilateral metastatic carcinoma of the eyes involving the choroid. The nature of the primary growth is of special interest.

Clinical History.

A man, aged 39, a congenital deaf-mute, was sent by his doctor to the Swansea General and Eye Hospital on Jan. 11th, 1926. It was stated that a blow received on the left eye three months previously had been followed by gradual failure of the sight in that eye. It was difficult to elicit accurate details, but the absence even of perception of light by the affected eye was evident. The right eye had vision of 6/5. The left pupil reactions were absent. There was no pain whatever. Under homatropine both fundi were examined, the right being found apparently normal. The left disc was very swollen, but the rest of the fundus showed no abnormalities, even the vessels being of normal size.

The man was admitted for observation but only remained three days owing to the restrictions placed on him. His physical state appeared normal, as also his blood pressure and his urine. Wassermann reaction negative; X ray examination did not help.

A month later he appeared again. The right fundus was still normal, but the left showed a totally different picture. The disc was now white and atrophic, and in the lower temporal area of the retina was seen a large flat detachment. To its nasal side and apparently quite separate from it there was a smaller flat attachment. Transillumination was very unsatisfactory.

The patient refused admission but attended the hospital weekly for observation. The detachment gradually spread over the whole fundus; there was still no pain. Transillumination now definitely showed something solid beneath the retina. The man refused to entertain the idea of enucleation of the left eye and avoided the department for three weeks. At the end of that time he returned to complain of the right eye; examination revealed a small flat detachment on the upper nasal area of the retina, the disc was normal, central vision 6/5.

After further irregular attendance he came to us a month later transferred from the Poor-law infirmary, now quite blind and very emaciated. Severe hæmoptysis soon followed, physical signs of tumour in the chest were noticeable, and tenderness over the liver. Two months later, having returned after a sojourn at home, he came to us again, complaining of acute pain in the left eye. A yellowish mass could now plainly be seen and the eye was acutely glaucomatous. In the right eye the detached retina was plainly visible without an ophthalmoscope, but the tension was normal. The left eye was enucleated and the diagnosis of carcinoma definitely established. The patient died five weeks later (August 14th) and a post-mortem examination

was made by Dr. Peter Milligan, to whom we are indebted for careful observations.

Post-mortem examination.—The salient feature of this examination was early leptomeningitis at the base of the brain without any cerebral tumour. (A detailed description of the right eye follows.) In the thorax was found a large mediastinal growth extending far into the roots of both lungs, but deeper into the left. Small metastases were scattered throughout both lungs. Similar deposits were found also in the liver and in glands around the abdominal aorta.

The right eye displayed invasion of the sclerotic on the nasal side of the eyeball, from optic nerve to margin of cornea, by growth averaging 4 mm. in thickness. One boss of growth was found external to the sclerotic. The choroid on the nasal side of the eye was deeply invaded and to a lesser extent on the opposite side. The retina was detached and pushed forwards all round the periphery of the eye except at one small area internal to the optic disc. Sections of this eye showed carcinomatous growth of the same nature as that found in the left eye and in the mediastinal tumour, but of more vigorous mode of growth and with tendency to fusion of the carcinoma cells into syncytial masses.

Microscopic examination of the mediastinal growth showed a slow-growing malignant tumour, the malignant cells very polymorphic, characterised by low proportion of cytoplasm and with distinctly acinar arrangement. In a few areas the malignant cells were of "oat-cell" type, in other areas their appearance was highly suggestive of a bronchial origin, the columnar type of cell being evident. Throughout the tumour there was much fibrous tissue formation and large areas showed necrosis of the carcinomatous elements.

Pathological Condition.

Carcinoma of the choroid rarely reaches the stage of being other than flat; here in both eyes the tumour had become quite large, filling up an important proportion of the vitreous space. This had led to a condition of glaucoma, which is described as very uncommon in intra-ocular carcinoma. C. A. Clapp [1] has found reports of 118 cases of metastatic carcinoma of the choroid and describes carcinoma of the lung as the second commonest prime focus for such metastases. According to this author carcinoma occurs bilaterally in one-third of the cases, and more frequently in the left eye than the right. The route of invasion of the eye is thought to be along lymph channels to the posterior part of the eyeball and then forwards by infiltration. Our case appears to have conformed essentially to general experience.

Examination of the left eye, removed during life, showed that the eyeball and surrounding tissues contained a solid growth which enclosed the optic nerve externally to the eyeball, forming a mass nearly 2 cm. in diameter. Within the eyeball the choroid was deeply and symmetrically invaded over the whole of the posterior part of its extent, the retina being correspondingly detached. In this orbit the greater part of the growth lay external to the eyeball. Sections of the growth showed a carcinoma described at first view as spheroidal-celled and highly malignant. The prime focus of the carcinoma at this period was not clear, and a pancreatic origin was suggested purely on histological grounds. The true origin was only determined after death.

It may be said that the growth was increasingly malignant as it progressed from lung to left eye and then to right eye, but in all these structures a common origin could be traced. The identity of the so-called "oat-celled sarcoma" of the mediastinum with carcinoma of bronchial origin has been recently discussed by W. G. Barnard.[2] In his series of 19 cases of mediastinal tumour the age-incidence tended to be relatively low—27 years in one instance. The age of our patient was 39. In mediastinal carcinomata this author has found great variation in the form of the constituent cells, and our experience with the metastatic growths in these eyes also exemplifies the pronounced differentiation of carcinoma cells whose prime origin was in bronchial columnar epithelium. Barnard's series does not include any orbital metastases.

[1] Clapp, C. A.: Amer. Jour. of Ophth., 1926, No. 7, ix., 153.
[2] Barnard, W. G.: Jour. of Path. and Bact., 1926, No. 3, xxix., 241.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

A MEETING of this Section was held on March 1st, Dr. W. T. GORDON PUGH, the President, occupying the chair.

Mr. A. ROCYN-JONES read a paper on

The Treatment of Pes Cavus.

He said that pes cavus (hollow foot) was the name given to a foot with an unusually high longitudinal arch. Great variation in the relative heights of the arch was possible within normal limits, and often hollow foot of mild degree caused no trouble. Cavus, however, was frequently associated with some other deformity. Mr. Rocyn-Jones dealt mainly with true or essential cavus.

Ætiology.—Often the ætiology was not very clear, as the disability was not manifest until long after the exciting cause had disappeared. But there were distinct contributory causes, which could be classified as follows: (1) Postural, due to (*a*) faulty footwear, or (*b*) habit gait, compensatory for a short limb. (2) Paralytic, due to (*a*) acute specific fevers, including slight paralysis following rheumatism, scarlet fever, measles, and diphtheria; (*b*) infantile paralysis; (*c*) chronic nervous disease, such as Friedreich's ataxy and progressive muscular atrophy; (*d*) congenital spinal cord lesions; (*e*) external popliteal nerve injury. (3) Traumatic (*a*) foot injury, (*b*) racial custom—e.g., Chinese foot.

Mechanism of Deformity.—The maintenance of the long arch of the foot, said Mr. Rocyn-Jones, depended primarily upon the tone of the muscles. Paralysis of the tendo Achillis would cause the heel to be drawn towards the toes by the plantar muscles, thus producing a cavus deformity, and the opposing dorsiflexors would tilt the foot upwards, but when these dorsiflexors were paralysed, an equinocavus deformity resulted. Duchenne attributed pes cavus and the associated clawing of the toes to paralysis of the interossei and lumbrical muscles, this allowing the long and short extensors of the toes to overact by hyper-extending the first phalanges and flexing the two distal phalanges. C. A. Parker, of Chicago, believed that the deformity was due to the perversion of the normal reciprocal action between the flexors and extensors of the toes.

Clinical Types.—There were two main clinical varieties: talipes arcuatus and talipes plantaris. In the former the heel and ball of the foot were in the same horizontal plane, whilst if the ball assumed a lower level than the heel, the condition was termed talipes plantaris. Patients with pes cavus usually sought advice because of continued fatigue and pain in walking, due to the limited treading surface of the sole and excessive pressure on the heads of the metatarsals.

Treatment.—In slight pes cavus with a tendency to contraction of the toes the mother of the child should be taught to manipulate the toes and encourage the child to flex and extend them, a slotted metal splint being worn at night. The boots must be long enough and roomy enough to give the toes due play. Where the deformity was of moderate degree, with painful metatarsal callosities, a transverse leather bar should be added to the sole of the boot, behind the position of the corns. If these measures did not give enough relief, an attenpt should be made to flatten the arch by operation. Formerly, Mr. Rocyn-Jones had tried to do this either by osteoclasis, by simple tenotomy of the plantar fascia with wrenching, or by excision of the plantar fascia. He had now, however, given up these procedures in favour of the Steindler operation. Still, to that operation there were two serious drawbacks—namely, that sloughing of the wound edges occasionally

followed, and that there was a delay in the after-treatment. Steindler himself now operated through an incision on the inner side of the foot, extending from the back of the heel to a point in front of the anterior end of the os calcis. Three weeks after the operation the patient commenced to walk in soft shoes, and he was also taught toe exercises.

In pes cavus of severe degree with gross bony deformity, every step by the patient was painful, and an attack on the soft parts alone was unlikely to bring relief. In such cases, he thought, the Steindler operation should first be performed, followed later by bone-resection. He favoured cuneiform tarsectomy at the point of maximum convexity of the arch. In cases where the bony deformity was not very great but there was much dropping of the head of the first metatarsal, a good deal of improvement could be brought about by the following method which Mr. A. H. Tubby had shown him. A few weeks after the sole had been stretched by Steindler's operation an osteotomy of the first metatarsal was performed at the junction of the anterior third and posterior two-thirds. The corrected foot was encased in plaster for six weeks, and then treated by massage and exercises. Sometimes, in combination with an operation on the plantar fascia, it was necessary to cut the extensor longus hallucis and re-attach it to the first metatarsal, the distal end being joined to the extensor brevis hallucis. The result, however, was sometimes disappointing. There was little scope for arthrodesis in essential cavus, said the speaker, but it was very effective in flexion of the great toe with a painful dorsal corn. In conclusion, he pointed out that pure cavus deformity was not very common, but cavus was frequent in association with other deformities. Symptoms usually developed during adolescence, though the exciting cause might have been an illness at a remote date. There was a dropping of the foot due to weakness or paralysis with resulting secondary contracture of the plantar fascia, forcing the bony arch to expand upwards during growth. The form of treatment called for depended on the degree of the cavus. Proper after-care, in the way of splinting, exercises, electrical treatment, and footwear, was important.

Discussion.

The PRESIDENT thought that the profession insufficiently appreciated the fact that mild pes cavus was apt to follow an acute illness. Children who had been kept in bed for a long time often suffered afterwards from mild pes cavus, and those kept in bed for more than a few days should have the weight of the bed-clothes taken off the feet by means of a low cradle. They should also have daily ankle and toe exercises.

Mr. NAUGHTON DUNN said that it was common to see a cavus deformity in which there was no shortening of the tendo Achillis, and that, he thought, was the true pes cavus. It often resulted from a weakness of the dorsiflexors of the ankle; the extensors of the toes, in their effort to dorsiflex the foot, caused dropping of the metatarsals and shortening of the structures of the sole of the foot. This type was usually well treated by division of the plantar fascia and the structures attached to the os calcis, by Steindler's or some other simple operation, the important point being that there should be complete over-correction of the deformity after the cutting part of the operation. The type of cavus deformity which caused most difficulty, and in which he was most interested, was that which occurred in children of 5 to 7 years of age, and was of insidious onset. It was progressive, and he did not know what the cause was. By division of the plantar fascia and the structures attached to the os calcis good correction of the foot could be obtained by wrenching and complete over-correction. The result appeared to be good, but there was a great tendency to relapse. This could be prevented by dividing the tibialis posticus tendon.

Mr. R. OLLERENSHAW spoke in advocacy of the operation of transplanting five tendons. Within four years he had done 33 operations of that kind on 27 patients. During the same period he had had only three cases of pes cavus which required a bone operation.

Mr. WHITCHURCH HOWELL thought that division of the plantar fascia should be done less and less, and in a mild case only if a metatarsal bar was not sufficient. The transference of the extensor longus pollicis through the neck of the metatarsal bone should be condemned, for it was anatomically unsound. During the last five years he had used a modified Steindler's incision; instead of the horse-shoe incision he made two short incisions, one on each side of the os calcis.

Mr. H. A. T. FAIRBANK said that for some years he had been in the habit of making an incision on the inner side of the foot to divide the ligaments which the Steindler operation did not enable the surgeon to reach. It was advisable to divide the ligaments between the internal cuneiform and the metatarsal; it made it possible to correct a bad case. Sometimes after the Steindler operation he had seen nasty lumps in the sole of the foot, and Steindler himself was careful not to do a subperiosteal operation at the tuberosity of the os calcis; he cut just superficially to the periosteum. In order to prevent relapses, Mr. Fairbank had, in a number of cases, transplanted the extensor tendons into the heads and necks of the metatarsal bones, and had been pleased with the results.

Mr. P. J. VERRALL spoke highly of the method of tendon transplantation. He had done it about 15 times, and had been very pleased with it. In the Steindler operation he employed an inch incision on the inner side, using the knife and cutting above the tuberosity of the os calcis, separating the lower part of the heel from the sole with the knife, and then using the periosteal elevator above the incision.

Mr. C. LAMBRINUDI said that Mr. W. H. Trethowan had been advocating the Steindler operation combined with scaphoidectomy, which had the advantage of a wedge incision and of leaving two cartilage-covered surfaces opposed to each other. Mr. Trethowan and he had operated on a fair number of cases in that way, and it enabled them to flatten out the arch very well. With regard to the toes, he had recently treated a case by arthrodesing every one of the interphalangeal joints, so as to get over the occurrence of clawing of the toes. That converted the flexor longus digitorum into interossei, whose action was the one thing which was lacking in claw toes.

Mr. ROCYN-JONES, in his reply, said that he believed in bone operations only for very severe deformity. In some cases he did not see how the cavus could have been got over except by a drastic operation, either a bone operation or one like Mr. Dunn's. In severe cavus the bugbear was inversion of the heel.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

A MEETING of this Section was held on Feb. 11th, Prof. J. W. BIGGER, the President, in the chair.

Sir JAMES CRAIG reported on a case of

Primary Carcinoma of the Lung.

A man, aged 51, was admitted to hospital on Nov. 1st, 1926. His doctor said that he had a pleural effusion, and that about a pint of blood-stained fluid had been drawn off.

On examination the face and ears were cyanosed; the upper thoracic region was œdematous with distended venules, and the arms and hands swollen from œdema. There was no enlargement of liver, no ascites, and no œdema of feet or legs. There was a right pleural effusion. The patient had a dry cough, but no accompanying expectoration.

On Nov. 14th the chest was tapped and 15 oz. of blood-stained fluid withdrawn. Later dyspnœa increased and the patient died on Nov. 21st. Two days before his death he coughed up a quantity of foul-smelling pus, evidently

from an abscess in the lung, although up to this time there had been no pyrexia at any time and no expectoration.

Dr. C. L. McDONAGH showed radiograms demonstrating the pleural effusion and, after aspiration, the lung abscess and tumour.

Dr. J. LAIT described the post-mortem appearances.

The right lung contained a large abscess and a tumour was found involving the root of the lung. The pericardium was adherent and thickened and contained numerous pea-shaped metastases, which did not involve the heart muscle. The tumour at the root of the lung surrounded and practically occluded the superior vena cava where it entered the right auricle. The left innominate vein was thrombosed. The spleen contained a small secondary deposit in its anterior border. There were many retroperitoneal glands involved by the tumour spread, which had also invaded both suprarenals. No metastases were found in the bones. All the other organs and viscera were found free of any tumour.

Microscopical examination of the primary tumour in the lung and its metastases showed a carcinoma composed of solid masses of spheroidal cells, supported by a fairly dense but variable stroma. Many of the cells showed vacuolation —apparently an attempt at secretion. In places there was an appearance of glandular formation.

In an advanced malignant tumour of this sort, said Dr. Lait, it was almost impossible to discover whether the cancer originated from bronchial or alveolar epithelium. Microscopically he had identified the tumour growing in the lining of the bronchi, though the bronchi contained no tumour visible to the naked eye. The localisation of the neoplasm to the hilus of the lung, with but little diffuse invasion of the lung parenchyma, suggested a bronchial carcinoma. He thought that it had its origin in the mucous glands of the bronchus. Discussing the tendency to classify all mediastinal tumours and lung tumours as either sarcoma or endothelioma, he referred to the recent investigation made by J. B. Duguid of Manchester, who had reinvestigated many mediastinal and lung tumours, and had found that many labelled as sarcoma or endothelioma were really carcinoma.

Dr. WILLIAM BOXWELL showed a specimen from a case of

Aortic Disease.

The patient was a man aged 37 who had been admitted to hospital about a year previously in an acute stage of cardiac failure. He had only been ill for four days, and stated that the condition had come on quite suddenly after an unusually hard day's work. He was a coal-heaver, and said that he shifted 17½ tons of coal daily from a dump on to a lorry. His heart was very much enlarged, and he had double aortic disease. He recovered comparatively quickly from the acute failure, and in five weeks was able to walk about.

Later, however, he returned to hospital with symptoms of cardiac failure, and on this occasion did not respond to any kind of treatment, and died rather suddenly.

Dr. Boxwell said that he had expected to find that the condition was of syphilitic origin and the patient said he had had syphilis many years previously. The Wassermann reaction was positive. But it seemed extraordinary that a man who had a syphilitic lesion could have done so much work, and could have had such a finely compensated heart. From the naked-eye appearance or even from the microscopical appearance, it was impossible to know what the heart muscle was able to do.

Dr. A. R. PARSONS described

An Unusual Case of Appendicitis.

The patient was a man who had almost recovered from an attack of influenza. A week after the attack he became jaundiced, and wandered in his mind. The urine was dark in colour, and contained bile pigment. The patient did not complain of any definite pain. The knee-jerks were absent; there was no history of syphilis. On admission to hospital his temperature was 99° F., his pulse was fairly rapid, and he was slightly delirious. He became extremely restless, and the next day his urine contained bile pigment and a little albumin, and the ammonium salts were greatly increased.

He was very violent during the afternoon, said Dr. Parsons, and in the night he became collapsed, and died at 10 o'clock the next morning, two days after admission. He had only been ill for ten days. Throughout the illness there was no vomiting, and Dr. Parsons had considered that the diagnosis lay between uræmia and acute yellow atrophy.

Prof. J. T. WIGHAM, in demonstrating the specimens, said that the patient had died of appendicitis. There was fluid on the left side of the abdomen and apparently a subphrenic abscess. It was interesting to note that the pus in the abdomen was on the left side, and the abscess was on the right side. There was no abscess in the kidneys or spleen. He was not quite certain of the cause of the jaundice, but thought it was probably due to an almost complete necrosis of the kidney, somewhat similar to that found in acute yellow atrophy.

The PRESIDENT read a paper by himself and C. R. BOLAND, and R. A. Q. O'MEARA on

Variant Colonies of Staphylococcus aureus.

He described how, by growing a typical *Staphylococcus aureus* (purified by six successive platings) in broth, and plating the broth culture at intervals a number of variant colonies could be produced. The departures from the normal were in respect of: (1) Colour; some colonies were quite white ("*albus*"). (2) Texture; some colonies were rough (R), in distinction to the normal smooth (S). (3) Cohesion; some colonies were viscid (V). In ordinary broth a large number of "*albus*" colonies were found after six days incubation; "*aur.*, R., VV." colonies were plentiful after 33 days. In glycerol-broth, in which the staphylococcus produced an acid reaction, "*albus*" colonies appeared as in ordinary broth but "*aur.*, R., VVV" colonies at a much earlier period. On agar, variants were produced but only in colour and viscidity; rough colonies were never found. Similar results to these had been found with other staphylococci. The variants, while they showed a considerable tendency to breed true, did revert, under certain conditions, to the normal type.

A number of other communications were made.

SECTION OF OBSTETRICS.

AT a meeting of this Section, held on Feb. 4th (partly reported in THE LANCET last week), Dr. BETHEL SOLOMONS read notes on

Epistaxis as a Symptom of Toxæmia of Pregnancy.

Having mentioned engorgement of the cavernous tissue of the nose was a symptom of pregnancy, and the rarity of epistaxis as a symptom of toxæmia, he reported in conjunction with Dr. T. G. Wilson, the following case.

A primigravida, 26 weeks pregnant, came to the Rotunda Hospital with all the symptoms of toxæmia; these cleared to some extent, but three weeks later she returned with such intense epistaxis that it was necessary to plug anterior and posterior nares. The urine was loaded with albumin and the blood pressure was 240.

The patient was in imminent danger of death, and labour had to be induced. After consideration of the various possible methods it was decided to do abdominal hysterotomy under spinal anæsthesia. The preliminary morphine and scopolamine were so effective that stovaine was unnecessary, and the operation was performed without difficulty. The nasal plugs were removed the following day. She got on well on water diet, but unfortunately was given turkey and pudding on Christmas Day; this caused marked disturbance of vision, and the oculist, Dr. F. C. Crawley, reported that she had retrobulbar paralysis. She was kept first on water, then on light milk diet, and was finally transferred to a general hospital where she had improved considerably.

Epistaxis, said Dr. Solomons, might be regarded in the same light as toxæmic accidental hæmorrhage and the intra-abdominal and other bleeding seen in many severe types of toxæmia; but it was very rare.

Dr. T. G. WILSON said that it was seldom necessary to plug the posterior nares, but in this case it had been absolutely necessary in order to stop the bleeding, though he thought that if the patient had not been

pregnant the loss of blood would have probably done her good, as it would have brought down her blood pressure, which was very high. The condition appeared to be rare. Referring to treatment by X raying the spleen, he said that if this case had not been so urgent this method of treatment would probably have been successful, as it would have brought down the high blood pressure, which he regarded as the cause of the epistaxis.

The CHAIRMAN was scarcely inclined to regard this case as one of toxæmia of pregnancy; he thought it more probably a case of severe nephritis supervening on pregnancy. In the vast majority of stillbirths the cause was underlying bad health of the mother. In this case the condition must have been present for some time, as it seemed to him unlikely that retrobulbar neuritis would come on 24 hours after the taking of solid food. Ocular symptoms, such as optic neuritis, of course made the prognosis in these cases much more gloomy.

Prof. A. H. DAVIDSON, referring to the termination of pregnancy in this case, asked if it would not have been less of a shock and less danger to the patient if labour had been induced by means of a stomach-tube instead of by opening the abdomen. Labour in these cases of albuminuria and toxæmia was usually very easy.

Dr. D. J. CANNON said that whilst, from the point of view of reducing shock, it was best to employ spinal anæsthesia, he thought that it was supposed to be bad in cases of high blood pressure, and the patient in this case had had a high blood pressure. He agreed with Dr. Cassidy that the case appeared to be more one of nephritic toxæmia than of toxæmia of pregnancy. Sometimes ocular symptoms occurred in pregnancy, but cleared up immediately afterwards. He thought that Dr. Solomons had been quite right to empty the uterus in this case. In nephritic toxæmia the great danger was severe deterioration of the kidney.

Dr. G. TIERNEY asked if Dr. Solomons had found in the literature any case of epistaxis as serious as the two cases which he had reported. He himself had had a case of epistaxis recently in a woman five months pregnant, but the epistaxis was checked by the administration of calcium lactate. She, however, had not had albumin in her urine.

Dr. SOLOMONS, in reply, said that he thought it was a true case of toxæmia; many women dated their troubles from a supposed chill or trauma, and little attention need be paid to them. The urine had been normal before pregnancy. It was a fallacy that the toxæmias of pregnancy occurred only in the later months; he had seen many examples in the fourth, fifth, and sixth months, and they were most difficult to treat. Abdominal hysterotomy was the method chosen because it was quick, and speed was necessary. X ray treatment of the spleen would not have been suitable for the same reason. He did not fear the possibility of sudden diminution in the blood pressure with spinal anæsthesia. He agreed it was difficult sometimes to differentiate between a true nephritis and toxæmia. The literature on the subject of epistaxis in pregnancy was meagre.

ROYAL MEDICAL BENEVOLENT FUND.—The following are some additional cases relieved at the last meeting:—

Widow, aged 55, of M.B. who died in 1923. No children. Supplements her income of £35 per annum by taking paying guests. Lives in her own house, rates amount to £25 per annum. There has been no paying guests for the past three months so the applicant asks for a little help. Voted £18 in 12 monthly instalments.

L.R.C.P., aged 70. Owing to age is unable to obtain work, and about three weeks ago had a stroke. He is now in a home and is dependent upon charity, as his savings are exhausted. Previous help given by the Fund amounts to £68. A further sum of £15 was voted.

Subscriptions may be sent to the Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W.1.

Reviews and Notices of Books.

TREATMENT OF CHRONIC ARTHRITIS AND RHEUMATISM.

By H. WARREN CROWE, D.M., B.Ch. Oxf., M.R.C.S., L.R.C.P. London: Humphrey Milford, Oxford University Press. 1926. Pp. 196. 8*s.* 6*d.*

Dr. Crowe here offers to the clinician and general practitioner his matured views on the causation and treatment of rheumatic disease. This volume is only the first half of a work to be completed by another section devoted to theoretical argument and a description of experimental technique for the benefit of the bacteriologist and specialist. It is, however, complete in itself. Dr. Crowe believes that chronic arthritis is a disease caused by bacteria, and has evolved a form of vaccine therapy for which he claims not only better results than from any other treatment, but the power of stamping out, if applied in the early stages, practically all forms of arthritis. The two conditions of rheumatoid arthritis and osteo-arthritis have each, according to him, their own causal organism; the latter disease is attributable to a non-hæmolytic streptococcus, while the former he believes to be caused by a certain group of white staphylococci, described by him in 1912 and named *Micrococcus deformans*. Both organisms are alleged to be present in either condition, but as primary and secondary infections respectively. Since their toxicity is low, he believes that the system does not generate immunity against them, and that the way to cure them is to raise the resistance of the body. The author admits that observers of the calibre of Prof. Stockman and Dr. S. Boorstein have either ignored or condemned vaccine therapy of chronic rheumatism, but, in his view, the fault has hitherto lain in the method and not the theory. Those who have tried and failed have, he says, not sufficiently realised and allowed for three important factors—the variability of the bacterial flora, the magnitude of the diseased area, and the frequent intolerance of patients to vaccines. These obstacles he claims to overcome by the use of sufficiently polyvalent vaccines, by very careful dosage according to Wright's law that the dose should be inversely proportional to the amount of the disease, and by careful allowance for sensitivity, which may be essential to the cure.

Dr. Crowe is an enthusiast who writes in an interesting and persuasive manner. The trial of his methods by impartial practitioners is certainly desirable.

SYMPTOM DIAGNOSIS.

Regional and General. By WILFRED M. BARTON, A.M., M.D., F.A.C.P., Associate Professor of Medicine, Medical Department of Georgetown University; and WALLACE M. YATES, A.B., M.D., Fellow in Medicine, Mayo Foundation, Rochester. London and New York: D. Appleton and Company. 1927. Pp. 851. £2 2*s.*

THIS book is designed "for quick reference while the patient is being prepared for examination or while he is dressing after the examination." Granted that such a sort of book is desirable, then the authors may be congratulated upon having produced a remarkable, complete, and concise volume. It consists first of all of regional symptoms, considered under such headings as "the jaw," "the larynx," "the lower extremity," and so on; then follows a section of nearly 200 pages on general symptoms, containing very complete articles on such subjects as insomnia, obesity, diarrhœa, and dwarfism. This part of the book contains little which can be criticised unfavourably. Elsewhere it is more vulnerable, since the main scheme, to arrange the causes of various symptoms "in order of importance," is not very successful in practice. For example, the first four causes of occipital headache (p. 7) are given

as neurosis, chronic parenchymatous nephritis, utero-ovarian disorders, and adenoids. Arterio-sclerosis is not mentioned in the list of causes of this symptom, nor is there any hint that the practitioner should take the blood pressure of patients complaining of occipital headache. The list of the chief signs of chronic parenchymatous nephritis is also misleading; these include œdema beginning in the face, increased arterial tension, diminished urine output, and high blood-urea. The method of attempting to give causes in order of importance also leads to the presentation of a long list of diseases which would be clearer if classified on some definite plan. This is particularly obvious in the section on dyspnœa (p. 391), where 32 common causes are set out in heavy type and a large number of less common causes in smaller type. There does not seem to be anything to account for the order in which any of these causes appear. Such a book is hardly likely to help even that practitioner who finds "that his memory is defective and that he has perhaps forgotten or never knew many of the causes of that symptom." It is, indeed, questionable whether a book deliberately planned to make medical diagnosis merely a turning up of symptoms and finding the highest common factor of a number of causes has any value. Unlike treatment, diagnosis can never be satisfactorily tabulated; it surely comprises the whole of medicine.

ULTRA-VIOLET RAYS IN GENERAL PRACTICE.

By W. ANNANDALE TROUP, *M.C.*, M.B. St. Andrews. London: H. K. Lewis and Co., Ltd. 1926. Pp. 59. 4*s.* 6*d.*

THE author of this small book pretends to no life-long acquaintance with the subject on which he writes, for he tells us in his preface that it gives "the experience of the author in ultra-violet ray treatment in his general practice during the last year." He hopes that it may stimulate others to utilise "this beneficial form of treatment." Those in whom enthusiasm is tempered by caution will probably consider that a longer experience of any form of therapy is necessary before conclusions of value can be drawn from it.

The first 30 pages of the book are devoted to a brief historical and scientific sketch of the subject and the technique of the therapy. Then follow 24 pages on the actual therapeutic applications and 5 pages of index, which seems a little out of proportion to the length or weight of the letterpress. The value of the book lies in the fact that it may induce readers to seek more information, while as far as it goes it is sound.

TRANSFUSION OF BLOOD.

By HENRY M. FEINBLATT, M.D., Assistant Clinical Professor of Medicine, Long Island College Hospital, Brooklyn, N.Y. The Macmillan Company. 1926. Pp. xiv. + 137. 12*s.* 6*d.*

THIS monograph gives in a compact form the main facts concerning the history, theory, and practice of blood transfusion. The information is up to date, and the author adopts a judicial attitude towards the much-discussed question of citrated versus whole blood. He regards both methods as of great value, and admits that there is no evidence that citrated blood is really injurious. His own preference, however, is for whole blood, and he describes at length a method depending upon the use of a syringe apparatus of his own design. This, in common with most whole blood methods of transfusion, necessitates the presence of the donor by the side of the recipient, so that it is unsuitable as an adjunct to a surgical operation. Dr. Feinblatt regards the classification of blood groups as being at present in a state of flux, owing to the discovery of other factors in addition to those present in the four Moss-Jansky groups. The author, however, has evidently found that in practice the usual four-group classification is a satisfactory working hypothesis.

THE ESSENTIAL OILS.

By HORACE FINNEMORE, B.Sc. Lond., F.I.C. London: Ernest Benn, Limited. 1926. Pp. 880. 70*s.*

THE essential oils are of great technical and commercial importance, being used not only in medicine but in the manufacture of foodstuffs and perfumery. The quantities imported into, and re-exported from, the United Kingdom every year are immense. Many of the essential oils are complex mixtures containing a number of different constituents; others are comparatively simple substances. Their chemical constitution shows a wide range of variation from compounds of low molecular weight to those intricate substances, the terpenes, which are characterised by a number and variety of closely related substances. Although many of the constituents of essential oils can be produced artificially, the oils are still obtained mainly from the plant world. The British Empire, with its varied climates and soils, should provide many of them, and Mr. Finnemore emphasises the comparative neglect of potential sources within the Empire.

The arrangement adopted is that of the natural orders of which 76 are dealt with, including lichens and liverwort, and 2000 oils are described. It is claimed that the book gives for each oil its botanical source, cultivation, commercial production, chemical composition, physical characters, methods of analysis, and uses in industry, but actually this ideal is impossible of achievement in reasonable space; the descriptions of the oils of turpentine and eucalyptus alone occupy 46 and 70 pages respectively. The labour entailed in compiling such a work must have been considerable, and could only have been undertaken by one possessing first-hand technical experience. Most of the recent advances have been embodied in the text so that the information is up to date; where the chemistry of the substances is particularly complicated the formulæ of the various compounds are set forth in tabular form, showing their interrelations. Some parts are rather scrappy or obscure and the botanical sources of oils described are not always clearly stated; but the book will be welcomed as a valuable source of information as to the nature, origin, and uses of the essential oils.

PÆDIATRICS.

Common Procedures in the Practice of Pædiatrics. By ALAN BROWN, M.B., and FREDERICK F. TISDALL, M.D., Physicians, Toronto Hospital for Sick Children. Toronto: McClelland and Stewart. 1926. Pp. 260. $4.

THE object of this book is to bring within the reach of students and practitioners the methods employed in the children's hospital at Toronto. The authors have adopted the plan of describing a selected number of procedures in sufficient detail to enable the practitioner to carry them out without further information. The chapter on artificial feeding of infants has the merit of being simple; a clear account is given of the use of diluted cow's milk with added carbohydrate, which is presented as the method of choice for thriving infants who cannot be breast-fed. Considerable attention is paid to the diets of older children, and many valuable hints are given about their general management. The technique of a number of therapeutic and diagnostic procedures, such as the parenteral administration of fluids and of chemical and biological reactions, is lucidly described, but the encouragement to use the superior longitudinal sinus for the introduction of fluids will not meet with universal approval. A useful chapter on difficulties in diagnosis prepares the reader for some of the pitfalls with which he may be beset in the examination of sick children.

This book should be of considerable use as a supplement to a text-book, both to the student and to the practitioner.

PHILOSOPHY.

The Meaning of Disease. By WILLIAM A. WHITE, A.M., M.D. London: Baillière, Tindall and Cox; Baltimore: Williams and Wilkins Company. 1926. Pp. 220. 13*s.* 6*d.*

THE author is concerned to urge upon medical men that they should take a more philosophic view of the subject of their study. In the rush for the discovery of new facts by the analytic method and in the constant refinement of technique there is too much neglect of that laboratory in which the equipment is ideas and intuitions, the procedures being processes of thought. The part of man which needs more attention is the psyche, and his social relations, which equally constitute an essential part of him, are also not considered as much as they should be. Dr. White writes in an interesting way and he certainly preaches from some striking texts; we may quote three: "Nature must be considered as a whole if she is to be understood in detail" (Bunge); "A fit organism inhabits a fit environment" (L. J. Henderson); "The last thing to be discovered in any science is what the science is really about" (Whitehead). It is good for us to be reminded of such sayings as these; they are worth thinking about. The book is nicely produced, but it is somewhat costly.

THE DANCE OF CIVA.

Life's Unity and Rhythm. By COLLUM. London: Kegan Paul, Trench, Trübner and Co. Pp. 94. 2*s.* 6*d.*

THE conviction that seeming diversities and differences are but passing and rhythmically varying phases of a fundamental unity led the philosophers of the East to symbolise Life and Death as the continuously flowing Dance of Civa in which construction and destruction are pulsating patterns. This conception is designed to teach us that many of the phantom barriers and conventional categories which we erect have no real existence. It may be so. But to common mortals barriers and categories are a necessity for any mental process which may reasonably be called thought, and it is perhaps because he is so sure that they ought to be neglected that Collum has written such a nebulous and unconvincing essay.

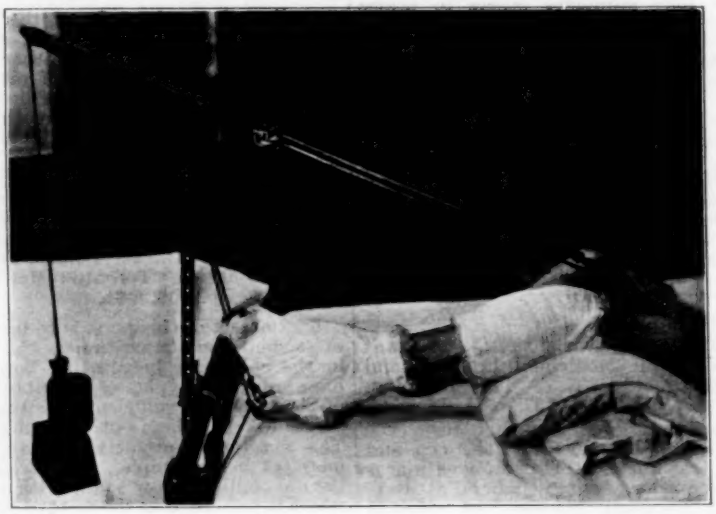
New Inventions.

AN INTERRUPTED PLASTER FOR FRACTURES OF THE LEG.

THE accompanying photograph illustrates the application of a simple and generally available form of splint for use in the treatment of fractures of the bones of the leg in the middle third, a common type of injury, especially from "run-over" accidents. Plaster bandages and the knee-flexion piece of a Thomas splint are the only requirements for fixation.

The method of application is briefly as follows:—

The patient is anæsthetised, and the leg cleaned, rubbed with spirit, and powdered; appropriate treatment being carried out for a wound, if such exists, and a dressing applied. Before any covering is placed upon the foot or knee, a line is drawn with a skin pencil from the inner border of the patella, vertically upwards on the thigh, in order to indicate the proper alignment—i.e., the relation of the great toe to the inner border of the patella, when the knee is covered up. Lint, padding, and a few turns of plaster bandage are then applied to the foot and to the region of the knee, which is slightly flexed, a space of 3 inches being left at the site of fracture. The flexion piece of the Thomas splint is placed in position and the plaster application continued, loops being made round the limbs of the splint in order to prevent slipping. The joints above and below the fracture are thus fully immobilised, and the fragments of the long bones are held in position to within a short distance of the actual site of fracture. When the leg alone is affected, a considerable amount of wool and a reinforced plaster are applied over the sole of the foot, so that the metal cross piece is entirely covered in, and with this form of ambulant splint the patient can be allowed out of bed, with the use of crutches, in two or three days. For purposes of massage, the plaster can be readily bi-valved by cutting behind the metal side bars.



Where the femur and leg bones on the same side are involved, extension is usually a matter of difficulty, but the method described here has been found serviceable in two cases of this type. In the first, the leg splint was applied in the manner described; a Thomas splint was then placed in position, with underslinging bandages to the thigh. The upper ends of the flexion pieces were rested upon the side bars of the Thomas splint in the usual way, but not clamped, so that traction upon them was effective in extending the femur.

The case illustrated is that of a lad of 16 years, who sustained a simple comminuted fracture of the tibia and fibula, and a transverse subperiosteal fracture of the femoral shaft, while stopping a run-away horse. A pillow under the thigh was found to give sufficient support at this level, as the extension pull on the upper ends of the metal side pieces preserved the essential forward curve of the femoral shaft, the knee being plastered in flexion.

In addition to having led to satisfactory local results, the method has these advantages. In compound fractures, local wound treatment does not interfere with fixation. Swelling at the level of fracture is not followed by painful pressure and so the plaster can be applied upon the first occasion when reduction is effected. The box-splint stage is thus eliminated, and the use of Sinclair's skate or other form of traction on the foot has seldom been found necessary. The condition of the soft parts can be observed throughout, and radiographic inspection is better than in the full plaster. Extension to the femoral shaft is simplified incases in which fractures exist above and below the knee in the same limb.

J. J. M. SHAW, M.D., F.R.C.S. Edin.,
Surgeon, Leith General Hospital; Assistant Surgeon, Royal Infirmary, Edinburgh.

THE LANCET.

LONDON: SATURDAY, MARCH 12, 1927.

THE PATENTING QUESTION.

THE application made by G. F. and G. H. DICK for a patent in respect of what are labelled "improvements in scarlet fever toxin and antitoxin and methods for producing same" will cause considerable apprehension. A specification has been deposited at the Patent Office in respect to the discovery of a process of isolating hæmolytic streptococci specific to scarlet fever, growing them in a suitable medium and obtaining therefrom toxin and antitoxin specific to scarlet fever. Patents in this respect, it appears, are being obtained both in England and America. The patent specification includes the processes for identifying the antitoxin, the method of using the human skin for tests, and other connected processes. If a system of monopoly is allowed to pervade medical science, what is to be the end of it? What is there to prevent the monopolist from stifling research, restricting the manufacture of vital remedies, or from raising prices so high that the poor patient will have no prospect of competing for them against the rich? Our Patents and Designs Acts contain provisions by which Government departments can intervene to operate processes in special cases. In naval and military matters monopolies are not allowed to prevent the nation from equipping itself with the necessary means of self-protection. Is it not time to apply similar principles to the fight against disease?

Problems of great importance are raised by this growing tendency to use the methods of commercialism in the production and protection of medical remedies. Thirty years ago, when E. von BEHRING patented his diphtheria antitoxin, professional opinion in Germany and elsewhere was naturally hostile to the piling up of personal fortunes from biological patents; the patent was everywhere ignored, and no effective protest was made by the patentee. Since then the attempt to use the machinery of patent laws for the benefit of the discoverer of a drug or progress have been chiefly concerned with new synthetic drugs, of which salvarsan is an example. Of recent years, however, another invasion of commercialism into the marketing of biological products has been manifest. Insulin was patented by the University of Toronto presumably in order that the proceeds might be used to further research. At any rate, no selfish use has been made of the monopoly. This result was doubtless the outcome of the judicious intervention of the Medical Research Council, whose immediate action prevented the country from being flooded by imitation products, and secured a safe and cheap supply as quickly as possible in this country. In other hands such a patent might easily have been abused. As a general rule, however judiciously money derived from the sale of patent remedies is expended, the exclusion of free competition in manufacture and the payment of royalties may keep up prices, and so prevent the full benefit of a new remedy or a diagnostic test from reaching the largest possible public. A further possibility of abuse occurs when the business firm to which a new product is entrusted by the patentee is unable or unwilling to provide a potent preparation on a commercial scale, while other firms are not allowed to attempt to do so. We called attention more than a year ago to the double confirmation of the work of E. HERRMANN and S. FRÄNKEL (1915), who prepared an active extract of the ovarian hormone by a method patented by them on Feb. 13th, 1918 (E.P. 113, 311). We still await the large scale production of a standardised active extract of this hormone. None of the commercial material which has reached this country appears to fulfil the biological test of producing œstrus when injected subcutaneously into a female rat. As a pleasant contrast, manufacturers were left free to produce for commercial purposes a parathyroid extract prepared by COLLIP'S method, and we have already been able to publish accounts of the valuable clinical results obtained by its use.

So long as protection by patent was confined to what are known as patent medicines, the matter was not overwhelmingly serious. There were objections to the system which invests the pill and the cough mixture with magic qualities in excess of their merits, but the general improvement in public knowledge has mitigated these evils; medical men may think hardly of the situation, but the Exchequer will remember that a not inconsiderable revenue is derived from the stamp duties on proprietary medicines. Selfishness is not a vice of which its worst critics have hitherto been able to accuse the medical profession or the research worker in this country. Medical ethics reject monopoly. What is to be the effect upon research if the Patent Acts are invoked to protect each stage in scientific progress? Rewards will be claimed for the man who gives some finishing touch, perhaps almost accidentally, to work done by men in many countries and for many years without reward. Indeed, if we glance again at the naval and military parallel, it is notorious that the special machinery for remunerating inventors in respect of devices used in the Great War has been open to much criticism, both on general principles and in the matter of particular awards. Medical research, conducted in the public interest, is as incompatible with secrecy and shut doors as with legal injunctions or heavy royalties. Present tendencies are disquieting and indeed alarming. Public opinion needs to be aroused and action taken. The medical profession will unhesitatingly repudiate the commercial exploitation of scientific discoveries which relieve pain and cure or prevent disease. In this condemnation it should be sure of the support of public opinion; having successfully combated the evils of monopolies three hundred years ago, this country is not likely to tolerate them to-day in the sphere of medical treatment.

THE RHEUMATIC HEART.

THE failure of even a rigid system of rest to stem the progress of rheumatic carditis once it has manifested itself is a disappointing fact to which attention was last year drawn by Prof. J. A. NIXON [1] after careful study of children warded in the Southmead Hospital at Bristol. They do not dispute the observation made by FRANCIS SIBSON in 1877 that cases of rheumatic fever are less often attacked by rheumatic carditis when kept strictly at rest. This dictum is now regarded as definitely proven, and indeed forms the basis of the modern treatment of acute rheumatism; but enthusiasts have hoped that where rest has preceded as well as followed signs of a pathological state of the heart, complete restoration of function might ultimately ensue. Dr. CAREY COOMBS in a Chadwick lecture, which we print on another page, quotes hopefully evidence of "a surprising number of apparent recoveries, even among children whose hearts have undoubtedly been damaged." The observations made at Southmead do not encourage this optimism. Even if the patient is actually in a hospital bed when the earliest signs of cardiac involvement are detected, Dr. NIXON and his co-workers do not now believe that its progress can be arrested or that however long the child is kept at rest a really sound heart will result.

If further experience confirms this distressing prophecy, it is the more urgent to seek means to prevent the primary disease. Dr. NIXON points out that in a sense this is being achieved, relatively at least, by means of some unknown factor in the life of the upper classes, since rheumatism hardly exists in our great public schools. In an introduction to a report on Social Conditions and Acute Rheumatism, which we summarise on p. 562, Dr. G. F. STILL confirms the rarity of this condition among well-to-do patients; indeed, this well-recognised class-incidence of rheumatic fever, as one of the few things certainly known about the disease, gave hope to the investigators working in London and Glasgow under the auspices of the Medical Research Council that even in the absence of any secure knowledge of its causation, a careful study of environment might indicate means for prevention or at least reduction. But when the hospital patients under investigation were divided into three classes it was found, contrary to expectation, that a comparatively small proportion of the rheumatic cases came from families belonging to the lowest class, where the children have insufficient and unsuitable food, clothing, accommodation, and outlet, and suffer also from lack of discipline, regular meals, and sleep. Nor did inquiry into heredity yield much clearer results. In 260 out of the 721 rheumatic families examined—or 31 per cent.—there were, it is true, one or more persons in addition to the rheumatic patient suffering from rheumatism. The general picture presented by these family histories, however, is that of rheumatism attacking several members of one generation rather than of the disease being handed down from one generation to another, though diagrams of some 300 family trees set out on pages 23 to 30 of the report suggest that there is some hereditary predisposition to attack in rheumatic families. The infrequency of rheumatism in the four Poor-law residential schools studied—1 per cent. against some published statistics of 3·6 per cent. in elementary schools—lends no support to a theory of heredity, while it does confirm the idea that a high standard of food, clothing, housing, and general care has some influence in preventing the disease. Dr. STILL does not ignore the possibility, however, that the comparatively sequestered life of these children in a community which has little contact with the outside world may involve less exposure to infection. This view would imply that rheumatism may be conveyed by infection, which assumption is difficult either to accept or to reject. The incidence of rheumatism among those in close contact with a known sufferer was high enough to suggest to Dr. STILL and his co-workers the possibility of transmission of the disease, though no conclusive evidence of contagion from case to case has been obtained. Of 382 persons sleeping in the same room as 192 rheumatic children, 50, or 15 per cent., were rheumatic. In the light of these findings the cautious family doctor may consider it his duty to advise, at least, some degree of isolation, thereby laying himself open to unanswerable questions about periods of infectivity and incubation, and possibly even to reproach for previous negligence. The results of this careful survey of rheumatic disease will thus bring little practical help in the solution of the problems involved. If some doubt has been thrown on the evil portent of such well-established bogeys as tonsillitis and damp houses, a new source of anxiety has been raised. It would be unsafe to belittle the value of even slight indications of a way to prevent a disease whose sequelæ may be so severe, but the evidence is happily not sufficient at present to impose the boredom of quarantine on the patient during the long recumbent period which modern treatment exacts.

The ingenuity and tact shown by the group of workers conducting this investigation in devising and carrying out inquiries as to family incidence, association with sore-throat, and with various social and housing conditions deserved a more dramatic outcome. The inquiry has given provisional answers to many interesting questions, even if it has failed to give any clear view of the lines on which prevention should be sought. We must reluctantly agree with the statement made by the Medical Research Council in a preface to the report—that it seems improbable that much further progress can be made until the causative agent of acute rheumatism is identified.

[1] Bristol Medico-Chirurgical Journal, 1926, vol. xliii., p. 96.

MEDICAL RESEARCH IN DANGER.

THE Dogs (Protection) Bill, now in print and awaiting its chance of discussion in the House of Commons, is framed in language identical with that of Lord Banbury's Bill rejected in 1925. It proposes that it shall be "unlawful to perform any experiment of a nature calculated to give pain or disease to any dog for any purpose whatsoever, either with or without anæsthetics," and that no such experiments shall be licensed. If these proposals were to become law, they would place an insuperable and permanent barrier across some of the chief paths of medical and veterinary research. Evidently support for the Bill is being canvassed by means of the old prejudices, and is based upon the old misunderstandings and distortions of the truth. It is therefore necessary to repeat once again what has been said before in opposition. Many supporters of the Bill undoubtedly think of vivisection as the dissection of a living animal while it is fully conscious of pain; they undoubtedly believe that vivisection in this sense can be, and is, freely practised by medical research workers without restraint under the existing law; they are convinced that fresh legislation is essential in order to protect live dogs from the callous and inhuman infliction of pain. On no other basis can anyone explain the statements made in support of the Bill.

The petition to be addressed to Parliament by the National Canine Defence League, with which the Royal Society for the Prevention of Cruelty to Animals is not associated, expresses the opinion that "the dog has of late years been specially selected by vivisectors for extensive and peculiarly revolting and painful experimentation." The same petition speaks of "demonstrations of a prolonged and agonising nature before classes of students." Sir THEODORE COOK, in a letter in the *Times* of March 7th, recalls the fact that on the back of the entry forms of Cruft's Dog Show was printed an imaginary picture representing an operation performed in France about 100 years ago by a man who died in 1855; beneath the picture was displayed the following sentence: "209,014 experiments on living animals were performed during 1925, many of these being upon dogs." Obviously, as Sir THEODORE COOK observes, the uninstructed reader is intended to infer that operations of the kind illustrated in the picture are constantly happening in England to-day. He asks whether Lord BANBURY or Sir ROBERT GOWER knew of any instances of dogs suffering severe pain after recovery from anæsthetics which were not put to death as humanely as the 28,565 dogs destroyed in the Battersea Dogs' Home during the same year. We look in vain in all the mass of antivivisectionist propaganda for any fair admission of the extent to which dogs are protected by the existing law, or of the measures taken (under strict Home Office regulation and inspection) to prevent the infliction of pain. Nothing is said of the elaborate precautions which govern the licensing of the research worker, of the substantial safeguard which insists that his application for a licence shall be signed and countersigned by responsible authorities, of the special certificate which is required if feeding experiments or inoculations are to be done, or of the fact that 95 per cent. of the total number of so-called vivisections come within the class covered by this special certificate. Nothing is said of the fundamental restrictions imposed by the Cruelty to Animals Act of 1876, or of the further restrictions made by the Home Office thereafter. Nothing is said either of the additional safeguards (under Section 5 of the Act) whereby experiments on a dog or a cat are even more stringently regulated. Nothing, finally, is said of the profound benefits to the human race which have resulted from the carefully restricted and officially supervised employment of experiments upon animals in the alleviation of human pain and the cure and prevention of human disease. Information in this respect has been issued in publications more accessible to the medical profession than to the general public. Of the technical details of that information the supporters of the Bill may naturally be ignorant, but there is one aspect of experiments upon animals of which every dog-lover should know. The study of distemper may not only help us to understand and repel certain obscure diseases from which mankind suffers, it also holds out the reasonable prospect that, sooner or later, a great menace may be removed from the canine species. The so-called Dogs (Protection) Bill will bar the advance of science towards the finding of a remedy. It may not unfairly be given the title of the Dogs (Continuance of Distemper) Bill.

Distemper is but one of many problems for the research worker, but what is the attitude of the supporters of the Bill towards it? Their avowed purpose is the total prohibition of all experiments which may promote the cure and prevention of this disease. Sir THEODORE COOK quotes the chairman of an antivivisectionist meeting held last January as having said that the Field Distemper Council had spent three years "in torturing dogs in the most abominable manner." If this were so, why did not the Royal Society for the Prevention of Cruelty to Animals, which seems itself to be concentrating upon a merely antivivisectionist policy, prosecute the offenders to conviction? In the debate on Lord Banbury's Bill in 1925 Lord LAMBOURNE, who supported the Bill, found it necessary to concede that the Bill might be amended so as to make an exception in favour of distemper experiments. Logic we have learned not to expect in the discussion of this subject, but, if distemper experiments are admitted to be unobjectionable, what becomes of the principle of the Bill?

Annotations.

"Ne quid nimis."

THE LISTER DOCUMENTS.

DURING the forthcoming Lister centenary celebrations the cabinet containing Lord Lister's instruments, manuscripts, diplomas, and other papers, which occupies a position of honour in Room I. of the Museum of the Royal College of Surgeons of England will be a centre of peculiar interest. A noble piece of furniture, the cabinet was the late Sir Rickman Godlee's tribute to the memory of his illustrious uncle. In it behind glass are displayed Lister's instruments and the same collection is continued in another case against the neighbouring wall, which forms a companion collection to the relics of John Hunter in a similar museum case close by. Lister's documents, however, are only partially visible to the public eye, and a number of them, beautifully bound and cared for by his nephew, are locked up in the cabinet drawers. Very interesting among the latter are a number of diagrams of bacteria and general pathology, and also the rolls of common paper, some half-dozen in number, on which over 40 years ago Lister caused a horse, a dog, and a rabbit to place on record the relative pressures of blood in systole and diastole. The elaborate conclusions which he then reached are fully set out in Vol. III. of his "Common Place Book," a work in four volumes here preserved behind a glass door. These books contain the record of the successive experiments in which the great surgeon engaged. They are largely in the handwriting of Lady Lister, who laboured with devotion in her husband's behalf till death cut her off, sadly and suddenly, when the pair were on their travels in March, 1893. Sir Rickman Godlee, in his biography of Lister, has painted a vivid picture of the manner in which these manuscripts were written, often long after midnight, owing to Lister's unwillingness that anything should be set on record till he himself felt sure of it. The illustrations, almost all by the investigator, are fine examples of delicate draughtsmenship, and many who see them will be surprised to learn that he was an anatomical artist of such a high order. The most important volume in the collection under discussion is without doubt the slim folio labelled by Godlee "Notes and Drawings. Suppuration. Lister. 1851-1907." This is the very scripture of Listerism, a treasure beyond price.

Of the other MSS. in the collection there may be mentioned also five letters from Pasteur, in one of which the famous Frenchman speaks of having heard dimly during many years of his English colleague's special investigations and testifies to his own interest in them. He writes as a sick man, his head hanging painfully in sympathy with his semi-paralysed side. The originals of Lister's principal courses of lectures in Glasgow, Edinburgh, and King's College are also

here, together with five folios containing complimentary addresses signed by the greatest names in science and medicine. The degrees and diplomas alone number some 36. Unlike John Hunter, unlike Shakespeare himself, this mighty pioneer of modern methods in surgery has been "documented" to perfection. None of his manuscripts seem to be missing, and all are religiously cared for and preserved.

CAPILLARY PERMEABILITY.

THAT the capillary wall is normally in a condition of delicately adjusted differential permeability follows from the facts that the volume of the blood is kept constant, and that the nutrition and excretion of the tissues are adequately performed. The normal endothelial cell lets water through freely and, as far as we know, offers only a partial obstacle to simple molecules of dissolved substances. On the other hand, it is nearly impermeable to proteins, and it is changes in this quality which have for long been familiar; transudates contain little coagulable protein, while exudates contain much, and the amount of proteid is a guide to the permeability. In more recent times evidence has accumulated that gross alterations in permeability may affect the volume of the circulating blood; chlorosis is (or perhaps we should now say "was") presumably essentially an error in the mechanism which normally keeps a certain amount of the free fluids of the body inside the blood-vessels and leaves the rest (a variable quantity) outside. There are more satisfactory reasons for believing that the depletion of the blood volume in secondary shock is directly due to the increased permeability of the endothelial cells caused by the products of tissue destruction, and in particular by histamine and histamine-like bodies. The efficacy of histamine in producing this change locally is beautifully demonstrated by pricking through a drop of a highly dilute solution into the skin; a wheal appears almost at once. To find out more about this elusive mechanism and how it is affected in disease is evidently desirable and several explorations along different lines have recently been made. We have already drawn attention[1] to the series of papers which have been published in *Heart* by Sir Thomas Lewis and his co-workers at University College Hospital on the reaction of the skin to injury and their conclusion that the production of a local œdema with the formation of wheals is in the main due to the setting free of histamine (or some similar body with a like action) from the tissues injured by the provocative stimulus. Everyone reacts in much the same way, but the amount of rubbing which is necessary to evoke the reaction varies so much in different people that those who respond most easily may not unreasonably be said to have a disease—dermographia. Parallel inquiries on rather more complicated lines have been made by Dr. W. F. Petersen of Chicago,[2] who seeks to obtain some quantitative measure of what may be termed the inflammability of the skin in the manner of Gänsslen by putting on a standard cantharidin plaster, observing the time taken for a blister to form and then determining the percentage of proteins in the blister fluid, and comparing it with the percentage in the blood. The ratio blister protein/serum protein gives the "permeability index," and this ratio divided by the blistering time in hours brings the inflammatory vascular response into relation with the permeability. The method obviously measures a very complex process which it cannot completely dissect into its components, but Dr. Petersen and his colleagues have obtained results which suggest that it will prove informative. Thus, in general, capillary permeability varies inversely with blistering time, as one would expect. But in decompensated arterio-sclerosis high permeability may be found with a prolonged blistering time, which is interpreted as spasm of the arterioles with a damaged endothelium. On the other hand, Graves's disease shows always a short blister time, and the permeability index may vary a good deal. In skin diseases such as dermatitis herpetiformis and eczema, there is everywhere a short blistering time, and the percentage of protein in the blister fluid is nearly as high as in the blood serum instead of about three-quarters as much.

[1] THE LANCET, Jan. 1st, 1927, p. 38.

[2] Archives of Internal Medicine, vol. xxxviii., p. 663; vol. xxxix., p. 19.

THE LATE SIR FELIX SEMON.

WE have received from Dr. Emil Mayer, the well-known American laryngologist, a letter with reference to the autobiography of Sir Felix Semon, which was reviewed recently in our columns (THE LANCET, 1926, ii., 959). The purport of the letter is to call attention to certain matters omitted in the autobiography and not added by the editor, Dr. H. C. Semon, who wishes that attention should be called in medical circles to the circumstances. Both the autobiography and the various obituary articles which followed upon Sir Felix Semon's death alluded to the splendid work done by him when he founded the *Internationales Centralblatt für Laryngologie* in 1884, and Dr. Mayer, one of the first collaborators in this work, describes the machinery adopted, explaining why for business reasons it was printed in the German language. It was at one time projected that publication should appear simultaneously in German, French, and English, but on pecuniary grounds, although collaboration was gratuitous, this ambitious design was dropped. Prof. Mayer writes:—

"With his passion for order, Semon issued a prospectus for the new journal and the plan made then was strictly adhered to during the entire 25 years in which he was editor-in-chief. It was to be an index-medicus as complete as possible, under the direct editorship of the one chosen to represent his country, who signed his own name to each contribution noticed. The collaborator used his own judgment as to the length of his abstract. Facts known to laryngologists in articles written for the information of general practitioners were marked 'nothing new.' When comment was deemed advisable by the collaborator it was added in brackets. It is of interest to note that writers approved of this method of a 'chiel amang ye takin' notes' and frequently expressed their appreciation of the criticism, saying that they were thus made more careful in making statements. In the 16 years of his connexion with the *Centralblatt*, this writer knows of no single complaint of unfairness in the comments. At the end of the year, a summary of papers abstracted was published giving the number from each country. America with its 200 monthly journals always headed the list. Reports of the transactions of special societies and reviews of new books were also part of the duties of the co-editor. It was of the *Centralblatt* that Sir Felix said: 'Journals of reference exist in order that the reading public should know of articles published, presenting a résumé of their contents, but not to make the reading of the originals unessential.' After 25 years of editorship, Sir Felix could truly say that the Journal had become the centre of the interests of laryngology throughout the world."

Dr. Mayer's connexion with the *Centralblatt*, we learn from his letter, began by association with the first American editor, Prof. Lefferts, in 1898, and when he had been a co-partner in the scheme for ten years he conceived the idea that the twenty-fifth anniversary of the founding of the symposium would be a fitting opportunity for all associated with the work to present the founder with a lasting memento of the respect and the loyalty of his colleagues.

"I procured a list" he writes, "of all past and present collaborators and sent a confidential letter to each, asking if they approved, that each send me 85 to procure a suitable gift to the man we revered as chief editor. The responses were prompt and within a short time letters warmly endorsing the project were sent me with the amount requested, by 35 of the co-editors, including the publisher, who was permitted to participate at his own request. The choice of the memento was that of a silver box of the exact size and shape of a bound volume of the *Centralblatt*, the outer lid being an exact copy of the style and wording of a cover of the monthly number, its wording transposed to fit the purpose. The silver box was made by Tiffany and Company, of New

York, following their beautiful design, and the wording was that of Prof. A. Rosenberg, of Berlin. It read thus (translated):

25th Year January 1909
INTERNATIONAL CENTRALBLATT
FOR
LARYNGOLOGY RHINOLOGY
AND ALLIED SCIENCES

From the former and present collaborators:
L. Bayer (Brussels) A. J. Brady (Sidney) A. Bronner (Bradford) H. Burger (Amsterdam) O. Chiari (Vienna) J. Donelan (London) G. Finder (Berlin) B. Fraenkel (Berlin) H. Hecht (Munich) P. Hellat (St. Petersburg) G. Jonquiere (Bern) Ino Kubo (Fukuoka) J. Katzenstein (Berlin) F. Klemperer (Berlin) A. Kuttner (Berlin) W. Landgraf (Berlin) G. M. Lefferts (New York) N. Lunin (St. Petersburg) P. McBride (Edinburgh) Emil Mayer (New York) Edmund Meyer (Berlin) E. J. Moure (Bordeaux) E. V. Navratil (Budapest) E. Oppikofer (Basel) A. Rosenberg (Berlin) E. Schmiegelow (Copenhagen) O. Siefert (Wurzburg) R. Semon (Munich) A. V. Sokolowski (Warsaw) E. Stangenberg (Stockholm) A. G. Tapia (Madrid) Logan Turner (Edinburgh) E. Waggett (London) C. Zarniko (Hamburg) and the publisher

To the Editor
Sir FELIX SEMON
London

In love and respect, as a token of their appreciation of his highly valued services in the cause of Laryngology and in grateful recollection of the manifold courtesies extended by him to each and every one of them.

Berlin 1909
Published by August Hirschwald
N. W. Unter den Linden 68

This beautiful memento came as a complete surprise to Sir Felix and was most joyfully and gratefully received by him. He stated that he would always cherish it and that it would be kept in his family for all time."

The presentation was made without knowledge that it synchronised with Sir Felix Semon's retirement, while the episodes connected with the attitude of his successor need no repetition in these columns. The attempt under the evil influence of militarism to deprive Sir Felix Semon of his international reputation as the founder of the *Centralblatt* served only to enhance that reputation among those who consider that science does not acknowledge geographical boundaries.

BENIGN ADENOMA OF THE KIDNEY.

ACCORDING to Dr. E. Starr Judd and Dr. Harold E. Simon,[1] who report an illustrative case observed by them at the Mayo Clinic, and give a review of the literature, small benign adenomata of the kidney are not uncommonly found at autopsy. Their size varies from a few millimetres to 3 or 4 cm. in diameter, they are frequently multiple, and they may be found in one or both kidneys; but it is unusual for them to attain such a size as to cause symptoms of any severity. Three histological types of benign adenoma of the kidney may be described. The papillary form is the most common and is found in its purest and most elementary form in the smaller tumours. This type of structure also predominates in the larger tumours, in which, however, it is usually combined with one or both of the other types. The second type which is the next most frequent is the tubular or canalicular. While the tubules differ in character and appearance in the different tumours, they are of fairly uniform appearance in a given case. The connective tissue separating them is usually scanty and glomeruli are not found. The third type is the alveolar adenoma described by J. Albarran, composed of lobules of alveoli, whose cells often have a high fat content, giving them a vesicular appearance. Dr. Judd and Dr. Simon have little doubt that these tumours arise from the renal parenchyma, and though their relationship to malignant growths of the kidney has not been established, it is possible that they may become malignant. The present case was that of a woman, aged 51, who had suffered from intermittent attacks of pain and hæmaturia for the last 11 years. At first the attacks had been at intervals of from two to three months, but recently had become more frequent. For several years she had noticed a mass in the right side of the abdomen, and lately it had increased in size. Examination showed a large mass extending from the right costal margin to the crest of the ilium and across the middle line of the abdomen. Cystoscopy showed a normal bladder. Ureteral catheters were passed without difficulty, and the differential phenol-sulphonephthalein test yielded about one-third the normal return from the right side and a normal return from the left. The left pyelogram was negative, while the pyelogram of the right pelvis showed a rather indistinct outline. A diagnosis of right renal tumour was made, and on exploratory incision an enormous tumour was found arising from, and intimately associated with, the right kidney. Nephrectomy was performed and the patient made a rapid recovery. Histologically the tumour was found to consist of papillary and tubular structures in about equal proportions.

[1] Surgery, Gynecology, and Obstetrics, February, 1927.

SHOCK AND COLLAPSE.

IN his Hunterian Lecture to the Royal College of Surgeons of England on Feb. 28th Mr. Zachary Cope performed a salutary task in drawing attention to the vague state of the common understanding of the terms "shock" and "collapse." He attempted a more precise definition of the terms, and at the same time justly emphasised the variability of the clinical manifestations of these states. In particular he drew attention to the importance of the slow pulse-rate which sometimes accompanies shock and has often misled observers into a sense of false security. A slow pulse-rate is a grave sign if associated with a low blood pressure, estimation of which is easily made but often neglected. Mr. Cope showed, however, that even lowering of the blood pressure is not a constant sign. The late war afforded all too many opportunities for observing shock, and the stimulus of war needs provided most of the scientific evidence on which our knowledge of shock is based. Mr. Cope now seeks to apply the principles thus learnt to the fuller understanding of the surgical emergencies of civil life, especially perforations of a gastric or duodenal ulcer. He gave point to his remarks by quoting the case of a patient who was operated upon so quickly after the perforation of a duodenal ulcer that the combined shocks of perforation and of operation caused his death. The mysteries of "latent shock" and "delayed shock" were intensely investigated during the war, notably by Dale, Bayliss, and Cannon, but the theories then formulated have not provided a final solution. Mr. Cope's plea for recognition of the importance of the clinical observation of surgical emergencies gained much force from the actual cases which he described. He did not, for the present, enter upon discussion of the principles to be observed in treating the condition of shock, but this can only follow on further elucidation of the factors that are at work in its production. More research, in fact, by physiologist and clinician is still required.

CHRONIC ARTHRITIS.

IN a paper[1] based on the critical study of 1100 cases R. Pemberton and E. G. Peirce give a more hopeful opinion of the treatment of chronic arthritis than is usually held. Their patients comprised 400 soldiers on active service and 700 civilians, more than two-thirds of the latter being women. Treatment included removal of infected foci, dietetic and physiotherapeutic measures, and injections of non-specific protein and specific vaccine. Each case was treated on its merits and no attempt was made to exploit any particular line of treatment. Of the army cases

[1] Amer. Jour. of Med. Sci., 1927, No. 1, clxxiii., 31.

77 per cent. recovered completely and only 4 per cent. were unimproved. Of the civilian cases, which included the more advanced types, 24 per cent. recovered completely and 9 per cent. were unimproved. Demonstrable foci of infection were present in 70 per cent., and in others foci had been removed previously. Dental infection was present in 54 per cent. and tonsillar infection in 31 per cent.; urogenital infections played but a small part. Mere removal of foci of infection was insufficient to cause improvement. In some cases successive focal infections caused by different organisms occurred whilst the patients were under treatment, and in other cases tissues such as the tonsil, harbouring foci, were seen to become nearly or quite normal following improvement in the arthritis from a well-planned regimen. This suggests that focal infection may often be the result of a systemic imbalance as well as the cause of it. Many of the cases could be classified into the proliferative and degenerative types of Nichols and Richardson, which correspond roughly to the rheumatoid arthritis and osteo-arthritis of English authors, but many could not be classified. It would have been more helpful if a closer classification had been attempted, for a study of the age of onset, sex, and joints involved suggests that most of the cases were of the infective fibro-arthritic type involving only one or two joints, and it is the general experience that this type responds very well to treatment and that complete cure can be obtained. It is doubtful if joints attacked by true rheumatoid arthritis can ever be restored to normal, and the same is true of osteo-arthritis. Although Pemberton and Peirce consider that there is evidence of a common physiological disturbance underlying several clinical varieties of the disease it is perhaps more probable that under the heading of chronic arthritis are included several distinct diseases differing in their ætiology, pathological features, and response to treatment. There is but little resemblance between the rheumatoid arthritis of young women with its profound metabolic disturbances, the osteo-arthritis of the hip in elderly persons, and the infective arthritis of the knee or wrist which attacks mainly the soft structures without bony involvement. More progress may be made when these types can be more clearly differentiated and separately studied.

NATURE OF RABIES AND THE NEGRI BODIES.

EVER since the first description of the intracellular formations now universally known as Negri bodies, these bodies, whose appearance in the large cells of the central nervous system and in particular in those of the cornu ammonis is the chief histological finding in hydrophobia, have been of acute interest to pathologists. An unending argument has raged over their nature, the partisans of one theory declaring them to be parasites, whilst their opponents maintain that they are nothing more than the results of degeneration. Both sides, however, have agreed that their appearance is characteristic and pathognomonic of this disease. The latest contribution to the subject comes from C. Levaditi, S. Nicolau, and Mlle. R. Schoen of the Pasteur Institute.[1] These workers have already carried out very extensive researches into encephalitis lethargica and herpes, and the spontaneous (microsporidial) encephalitis of rabbits, and it has been long held by Levaditi that the first two of these diseases have much in common with vaccinia, poliomyelitis, and rabies; he believes that all are due to filtrable viruses and that all may show, under different conditions, affinities for both the epidermis and the central nervous system. Turning his attention now to rabies this fruitful investigator has attacked the problem of the nature of the virus and produced a voluminous piece of work. After pointing to the tinctorial and morphological similarities between the Negri bodies and the cysts of certain microsporidia, the theory is developed that the Negri bodies represent a stage—pansporoblasts—in the life-history of a protozoal parasite, the units of which at other times in its life-history are extremely small and capable of traversing bacterial filters. It is in this spore stage that the virus is eliminated by the salivary glands of a rabid animal and infects the bitten subject. The parasite reaches the central nervous system by means of the nerve trunks and pullulates within the cells of the brain. It must be conceived that all portions of the central nervous system become infected, since all are virulent, but that the development of the organism is more favoured in certain sites than in others; thus the medulla and pons are more intensely invaded and show the infection at an earlier stage than do other parts of the brain, and their cells, moreover, undergo histological degeneration; whereas the cortex cerebri, Purkinje cells, and the cells of the cornu ammonis, though infected, retain their histological integrity and show little or no degeneration. These are the very sites in which the Negri bodies develop; an apparent paradox which is explained by Levaditi and his colleagues by the assumption that it is only in the more resistant cells, whose morphological and physiological integrity is preserved for the longest time, that the pansporoblasts are formed, only the vegetative phase of the organism existing where its destructive effects are greater.

This thesis would give a plausible explanation to the disturbing fact, which has so often been used as an argument against the acceptance of the living nature of the Negri bodies, of their absence in *virus fixe*—the brains of rabbits succumbing to the inoculation of material of artificially exalted virulence, and hence presumably most rich in the infecting agent. If Levaditi's view is correct the *virus fixe* produces so profound and progressive an infection that the conditions of cell resistance, necessary for the production of pansporoblasts, are never realised. Numerous experiments are cited which give force to this argument. It has been shown in the progressive exaltation of virulence which goes to the making of *virus fixe* that, as the incubation period shortens, the size and number of Negri bodies diminish pari passu until when the stage of maximum virulence is reached—i.e., the *virus fixe* of Pasteur—they can no longer be found. And it has also been shown in this connexion that various strains of street virus differ greatly, as judged by the criterion of the Negri bodies, in their ability to become converted into *virus fixe*. In some this is readily accomplished in a few passages, but in others it seems impossible to carry out. The transformation into *virus fixe* is regarded by these authors as a mutation (the right to use this term may be questioned, as from their experiments the transformation is obviously gradual), which results in a definite loss on the part of the organism of the ability to reproduce the pansporoblasts stage; the change, at all events, is irreversible and by no experimental manœuvres can this virus be made to give rise to Negri bodies. In the view of Levaditi and his colleagues this mutation is associated with an increased affinity of the virus for the central nervous system. It therefore follows that the material used in the antirabic inoculation of man is essentially of a highly virulent character, but the lack of danger in its use is believed to be due to the dilution of the germs present in the preparations, and to the fact that the tissue into which the virus is introduced is little favourable for its further development in this newly acquired specialised form.

The general view put forward is by no means new, as the authors admit, while many claims towards the elucidation of the life-history of the rabies organism have from time to time been made. Noguchi at one time announced its successful cultivation by the procedures employed in the investigation of the globoid bodies of polio

[1] Recherches sur la Rage. C. Levaditi, S. Nicolau, and Mlle. R. Schoen, Annales de l'Institut Pasteur, vol. xl., No. 12, December, 1926.

myelitis, and Y. Manouelian and J. Viala[2] claim to have demonstrated the microsporidial characters of the virus and certain of its evolutive phases in the tissues. Levaditi and his collaborators have put forward a reasoned hypothesis which explains many of the difficulties in the way of the general acceptance of the Negri bodies as representing a visible phase of the parasite, and their view is supported by an abundance of ingenious experimental work. They propose for the organism the name of *Glugea lyssæ*. Whilst themselves convinced that their theory is correct, and offering serious evidence in support thereof, they do not pretend to have furnished proof and avow their complete ignorance of the larger part of the life-cycle of the organism of which they claim to have demonstrated a part.

SCIATIC PAIN.

THE Lady Jones Lecture of the University of Liverpool was delivered on Thursday, March 10th, in the Medical School of the University by Dr. Vittorio Putti, Professor at the Rizzoli Orthopædic Institution, Bologna, and formed a clear and in some directions novel disquisition upon the pathogenesis and treatment of sciatica. He pointed out that in the middle of the eighteenth century Domenico Cotunio was the first to recognise that a clinical entity often had to be dealt with under the name of sciatica, the next step towards diagnosis being taken by Charcot who drew attention to the association of sciatica with vertebral deformity, and Brissot who, working on the same lines, introduced the term sciatic scoliosis. But regarding sciatica as a symptom, save when the pain is due to direct involvement of the nerve by known pathological processes, he insisted that such sciaticas were not to be confused with rheumatic sciatica—so called from its assumed causation; and the œtiology of this common form he proceeded to discuss entitling it "essential sciatica." It was, he held, being cleared up by modern inquiry, and while there was no difference between pain originating in the spinal cord, in the peripheral nerves or in the sympathetic, the patients' descriptions, which had to be relied upon, introduced an uncertain diagnosis. Hence he made no critical examination of the theories in regard to localisation of pain, but concentrated on that factor in the causation which had attracted so much recent attention—namely, the vertebral element. The idea is not new that a nerve may be irritated in the canal or foramen which it traverses. Long ago it was recognised that many types of trigeminal neuralgia, facial, supra-scapular and Arnold's occipital nerve neuralgia, as well as ulnar and radial neuralgias, are brought about by mechanical irritation of the nerve trunk in the bony foramina or osteoperiosteal canals. Sicard, Prof. Putti reminded his audience, renamed these conditions "nervodocitis," but Goldthwait, an orthopædic surgeon in Boston, U.S.A., made the first investigation of the whole problem from the anatomical and mechanical aspects upon which mud modern work is founded. A striking result of that work, however, proved fruitless. In the inter-vertebral foramen between the fifth lumbar and the first sacral runs the fifth root of the lumbro-sacral plexus, a root which is the principal constituent of the sciatic nerve

It was conjectured that removal of the transverse process of the fifth lumbar vertebra might bring relief, but no such fortunate result occurred. But the lecturer pointed out that none the less cases of sciatica show one constant factor, the association of pain with anatomical alterations or functional disturbance of the lumbar spine. He described his personal investigations, especially with the assistance of X rays into various deformities of the spine, a study which he had commenced 15 years ago, when he published some of his results. He warned his audience that investigation of the intervertebral foramina did not tell the whole story, for as well as the vertebral canal the funiculus must be considered. He summarised the latest work of Bonniot and Forestier by pointing out that "the fourth and fifth lumbar nerves possess the longest funicular portion of those which constitute the lumbo-sacral plexus—i.e., they take the longest course through intervertebral foramina, while the funicular portion of these nerves, unlike the intra-spinal portion, does not lie within the arachnoid, but is only clothed by dura mater and is not bathed in cerebro-spinal fluid. Around the veniculous plexus there is a very rich venous plexus which is much influenced by mechanical conditions outside the funiculus. The absence of arachnoid, and therefore of a protective layer of fluid, exposes the funiculus to outside mechanical influences such as do not affect the root, while the surrounding venous plexus puts it at the mercy of any congestion and stasis that may occur in the neighbourhood from many causes." Here, then, is the critical region, and it is here that the importance of X ray examination is so obvious, but only if a clear interpretation can be put upon the evidence. No progress, Prof. Putti thinks, could have been made in the elucidation of many obscure problems, if X rays had not convinced surgeons that idiopathic or "essential sciatica" is synonymous with spinal arthritis. In the latter half of his lecture he supported the thesis with schematic figures and original radiograms.

[2] Encephalitozoon Rabiei Parasite de la Rage. Y. Manouelian and J. Viala. Annales de l'Institut Pasteur, vol. xxxviii, No. 3, March, 1924.

ULTRA-VIOLET RADIATION AND THE EYE.

IN an article in the *British Journal of Ophthalmology* for February, entitled An Ophthalmic Radiation Lamp, with a Note on its Diagnostic and Therapeutic Applications, Mr. W. S. Duke-Elder, of the National Institute of Medical Research and the Ultra-violet Clinic at Moorfields Hospital, issues a warning which is probably needed. It cannot be over-emphasised, he says, that despite the deplorably unfortunate attention of the lay press, ultra-violet light is not a universal panacea. The phototherapist of the eye should certainly be a competent physicist as well as a competent ophthalmologist, since dangers as well as benefits may follow the use of the new method. Suitable apparatus can be used with good effect in cases of "blepharitis, chronic conjunctivitis, corneal ulcers, recurrent, marginal, and hypopyon ulcers, recent corneal opacities, phlyctenular keratitis, tuberculous keratitis acne, and some cases of episcleritis." All these, however, are diseases of the external coat of the eye or its adnexa, and Mr. Duke-Elder is of the opinion that local phototherapy is contra-indicated in diseases of the inner eye, with the exception of those cases of iritis showing nodules on the anterior surface of the iris. The chief danger is that the incidence of radiant energy of any wave-length on the lens may be a factor in the causation of cataract. The heat rays are the most dangerous in this respect, but Mr. Duke-Elder believes that ultra-violet light may also be hurtful if it is focused on a lens predisposed to pathological change. The "treatment" of cataract by ultra-violet light has, he says, been carried out in some quarters; but "those results which have come under my observation might lead me to suggest it as a method for the maturation of cataract." The sentence with which he closes we will quote in full, for it should be pondered by any who are inclined to dally with non-operative cures for cataract. "The coagulation of protein is an irreversible chemical change. It seems not unreasonable to hope that in the future when our knowledge of this change and the factors causing it has been more fully developed, it may be possible to prevent its incidence or to delay or arrest its progress, but to set out to 'cure' cataract in the sense used above by any means, medical or physical, is quite unjustified." Mr. Duke-Elder's paper

incidentally lends support to our plea (THE LANCET, Feb. 26th, p. 450) that manufacturers of ultra-violet apparatus should be discouraged from the unrestricted sale of their lamps to the public at large.

THE TRUE TEMPERANCE ASSOCIATION.

THE annual meeting of this Association was held at the Caxton Hall, Westminster, on Monday, Feb. 28th, when the principal medical speaker was Dr. Robert Hutchison. Dr. Hutchison in an interesting speech put forward what he suggested to be the healthy point of view of the temperance question viewed from the angle of the great majority of medical men. These, he considered, believed from observation that patients whose habits in respect of drinking were moderate, proved no more subject to chronic disease and no more susceptible to acute illness than their teetotal patients. He alluded to the difficulty of proving this common impression by statistics, and reminded the audience that the figures to be obtained from life assurance companies, some of whom did and several of whom did not accept proposals from other than teetotallers, were vitiated by the fact that the bulk of the companies making no such proviso included in their records the excessive drinker as well as the moderate drinker, while no one doubted that excessive drinking is injurious to health. He referred his hearers to Prof. Raymond Pearl's statistical inquiry contained in a book entitled "Alcohol and Longevity" (New York: Alfred A. Knopf, 1926) for definite figures which were the result of an investigation into over 5000 individuals belonging to the working class in Baltimore. These figures, he said, were in his opinion as definite as any that would ever be obtained, and Prof. Pearl's conclusion from them was that the moderate drinkers were just as long lived, and as a matter of fact rather longer lived than the non-drinkers. The speaker's deliberate personal point of view was, he said, that the occasional and moderate use of alcohol is, from a strictly health point of view, beneficial rather than otherwise. Whether regarded as food or medicine, taken in moderation and at the end of a working day, it soothes the nervous system and helps digestion in many persons. Further, the moderate use of alcohol he considered to promote social recreation, which is so valuable for health, a use which is largely neutralised by the unattractive, not to say disgusting, environment of the usual public-house, where quick drinking is encouraged and where also it is often very difficult to get food to accompany the alcohol. Dr. Hutchison said that he was speaking here as a supporter of the People's Refreshment House Association and of Trust Houses, whose object was to improve the standard and class of the public-house in England; and he concluded by referring amusingly to the "Machiavellian intention" of teetotallers to keep public-houses in their present state, when they undoubtedly form an argument for abstention.

WE have received copies of the newly published Medical and Dental Registers for 1927 and of the Medical and Dental Students Register. The total number of persons registered under the Medical Acts from the beginning of registration in 1858 until Jan. 1st, 1927, is 100,430 and it is estimated that 52,614 of these remained on the Register on Dec. 31st, 1926. The number of names added during the year was 2120, and 46 were restored. Against this must be set the removal of 1159 names on evidence of death or under Sections 14, 28, and 29 of the Medical Act. The number of names added to the Register during 1926 was smaller than in any year since 1922, but the number of medical students registered rose to 1260, which is higher than at any time since that year. As regards the national sources of medical practitioners, it is interesting to note that of those whose names remain on the Register 47·89 per cent. are on the English local Register, 31·67 per cent. on the Scottish, and 14·86 per cent. on the Irish. The number of names on the Dental Register for 1927 is 14,395 of which 45 per cent. are registered with medical, surgical, or dental qualifications, and 55 per cent. under the Dentists Acts (1878 and 1921). A total of 229 dental students was registered during 1926. All three volumes are published for the General Medical Council or the Dental Board by Constable and Co., Ltd.

ABOUT 150 members of the Inter-State Post-Graduate Assembly of North America, accompanied by Dr. Charles Mayo, will reach London at the beginning of June, en route for a post-graduate tour of Northern Europe. While in London a programme of lectures will be arranged for them, to take place at Dartmouth House, the new building of the English-speaking Union. The following hospitals will arrange special programmes during the afternoons: St. Bartholomew's Hospital, Westminster Hospital, St. Thomas's Hospital, Middlesex Hospital, Charing Cross Hospital, London Hospital, King's College Hospital, Prince of Wales's Hospital, Brompton Hospital for Consumption, Infants Hospital, Vincent-square, Cancer Hospital, National Hospital for Diseases of the Heart, Chelsea Hospital for Women. A reception will be given at the house of the Royal Society of Medicine by Sir James Berry, the President, on Friday evening, June 3rd.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. J. F. Pace to be Surg. Comdr.

To be Surg. Lts.: J. Johnston, J. B. Patrick, J. R. C. Spicer, and C. P. Burges.

Act. Surg.-Lts. (D) to be Surg. Lts. (D): W. E. L. Brigham, S. Mawer, L. F. Fairey, L. A. Moules, F. D. Manners, G. Baker, L. R. Armstrong, H. M. Hill, and W. C. G. Ford.

ROYAL ARMY MEDICAL CORPS.

ARMY DENTAL CORPS.

Capt. R. H. Bebb to be Maj.

Temp. Lt. F. Widlake relinquishes his commn.

J. M. F. Whitby to be Temp. Lt.

Temp. Lt. W. G. Bradbeer, Dental Surg. Gen. List, to be Lt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. W. B. Winkfield having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Lt. G. C. F. Roe to be Capt.

TERRITORIAL ARMY.

Capt. L. P. Marshall, late W. Yorks R., to be Lt. and relinquishes the rank of Capt.

ROYAL AIR FORCE.

Flying Off. H. C. Patterson relinquishes his short service commission on account of ill-health.

Flying Off. D. Oliver resigns his short service commission.

Flight Lt. (hon. Squadron Leader) F. R. Humphreys relinquishes his temporary commission on completion of service.

Flight Lt. N. H. Medhurst (Capt. Army Dental Corps) relinquishes his temp. comm. on return to Army duty.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Cols. D. W. Sutherland and A. Whitmore.

The King has approved the retirement of Col. C. H. Bensley and Lt.-Col. Manmatha Nath Chaudhuri.

Lts. G. M. Irvine, G. J. Joyce, and J. S. Riddle to be Capts.

Bhavani Shanker to be Temp. Lt.

R.A.M.C. AND GUARDS.

DIVISION REUNION.

It is proposed to hold a reunion of all officers, W.O.'s, N.C.O.'s, and men of the Royal Army Medical Corps who served with the Guards Division during the late war, and those who have not had particulars should send their names and addresses to Mr. J. McKeown, late staff-sergeant R.A.M.C., No. 4 Field Ambulance, 90, Ashurst-road, North Finchley, N. 12. The proposed date of the reunion is Saturday, April 23rd.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXIV.—INFLUENZAL PNEUMONIA.

THE organisms most frequently associated with lobular pneumonias are *B. influenzæ*, streptococci, and pneumococci of various types. Besides lobular consolidation the pathological picture may comprise bronchiolitis, peribronchial inflammation and abscesses, œdema or collapse according to the predominant organism. The treatment of pneumonia resolves itself into providing or enabling the patient to provide sufficient antibodies to overcome the bacteria and their toxins. But antibodies are only slowly produced and the patient may succumb to the intoxication before sufficient are present. It is true that most patients will get well with simple expectant treatment, by which we mean little more than rest in bed with careful feeding and nursing. But we cannot pick out these patients from the others in whom the immunising response fails, and faced with a mortality of 20 to 30 per cent. we must ask ourselves whether more direct help cannot be given. The only specific treatment available in influenzal pneumonia is with vaccines, which are of considerable assistance when injected promptly in adequate doses.

Pneumonia should be regarded as an acute medical emergency demanding as prompt action as any surgical emergency. The object of specific treatment is to control the infection before it gets out of hand. Sometimes diagnosis is delayed until signs of consolidation are present, owing to the unfortunate confusion between the disease and one of its manifestations. The worst cases often have no recognisable consolidation. The early symptoms are so striking that it should be possible to take prompt measures within 24 or at most 48 hours of the onset, and the patient's fate may be decided within the first two days.

General Treatment.

Detailed instructions must be written down, especially when patients are nursed by unskilled relatives. First I would place absolute rest and free ventilation. From the beginning patients must be kept strictly in bed. Most patients object to the use of a bedpan, and unless strict orders are given at the beginning they will get out of bed as long as it is physically possible. Too much effort is caused by routine washings, reaching out for the sputum mug or feeding cup, and sitting up to cough. One garment slit down the middle should be worn and so prevent the exhausting struggle to get night-shirt and vest over the arms and head. Windows should be open night and day and the bed unscreened in the middle of the room. Fresh air is the finest circulatory tonic we possess, but it must be used with common sense and the patient must not be exposed to icy draughts of cold air or to glaring sunlight. During the initial chilly stages abundant bedclothes and a hot-water bottle are required, but when the fever is established one sheet and blanket are sufficient. Gamgee jackets are relics of the days when it was thought that pneumonia was due to cold and therefore should be treated with heat. Sponging night and morning should be done as a routine. Tepid water is usually advised, but very hot water at 110° F. by causing dilatation of capillaries is more effective in causing heat loss. Additional sponging can be done when the temperature taken four-hourly exceeds 104°.

Diet.

The most easily assimilated food is glucose, which has the additional advantages of feeding the heart muscle and preventing acidosis. One pound should be dissolved in three pints of water with the juice of two lemons. If this is taken freely over the 24 hours the amount of milk given need not exceed one pint and should be citrated. Coffee or tea can be added to some of the feeds. If additional food is required it can be given as albumin water, the whites of two or three eggs in one pint of water, flavoured with a little meat extract. Beef teas have a very small nutritive value and are objectionable on account of the large amount of extractives.

The hygiene of the mouth requires constant attention. Dentures must be removed and the mouth wiped out with a rag moistened with a weak watery antiseptic such as listerine before and after food. Washes containing glycerine should not be used. A spray of parolein or chloretone inhalant to the nose adds to the patient's comfort. Three grains of calomel at the onset followed by a saline may be given, but thereafter a morning soap-and-water enema will relieve the bowels and prevent distension. A simple febrile mixture containing pot. citrate gr. 20, liq. ammon. acetatis drachms 4, will aid the action of the skin and kidneys.

Vaccine Treatment.

A vaccine for use in influenzal pneumonia should contain equal numbers of *B. influenzæ*, pneumococci, and streptococci, and be made so far as possible from primary cultures of various strains. For an adult a suitable dose is 100 millions of each organism; for a child of twelve, 50 millions and for a child of two or three, 10 to 20 millions. Much larger doses can be safely used. When such doses are used on the first day of the illness in the majority of cases the temperature falls to normal during the following day and no further treatment is required. With each day's delay such rapid defervescence becomes less likely and the dose may have to be repeated every 24 hours until the temperature falls. When injection is delayed until the fourth or fifth day little can be expected from specific therapy. In a series of 107 consecutive hospital cases the results were as follows:

Day of first injection.	Cases.	Recovered.	Died.	Temperature normal in—	
				24 hours.	48 hours.
				%	%
1st	28	28	0	71·4	85·7
2nd	23	22	1	47·8	56·5
3rd	22	20	2	50·0	72·7
4th	20	15	5	30·0	40·0
5th	14	12	2	35·7	63·5
	107	97	10	50·0	65·0

The only death among 51 patients injected during the first two days was that of a young woman admitted with mania who died of pulmonary embolism on the ninth day after the temperature had been normal for five days. Seven out of the ten deaths occurred in patients not injected until the fourth or fifth days, four were complicated respectively with mitral stenosis, advanced pregnancy, meningitis, and asthma, and the three others had considerable albuminuria.

The chief obstacle to the use of vaccines has been the fear of a negative phase. A negative phase can only occur in a patient who is "sensitised," that is, possesses specific antibodies. During the first few days of pneumonia and other acute infections the patient has no antibodies and is not sensitised, so that a large dose can safely be given. Indeed, as much as 5000 to 20,000 million pneumococci have been injected intravenously into pneumonia patients with good results. The very rapid effect obtained suggests that the first action of the vaccine is non-specific, the specific effects being obtained later.

Symptomatic Treatment.

In the early stages relief of pain and sleeplessness is important. Leeches, when they can be obtained,

give quick relief to the pleuritic pain. Antiphlogistine can be kept on for 24 hours and is preferable to linseed poultices, which require frequent disturbance of the patient, but the latter are more easily applied by the unskilled. With either, care must be taken not to embarrass the chest movements. In hospital patients immediate relief can be given by the insertion of 400 to 500 c.cm. of oxygen between the pleural layers with a pneumothorax apparatus. Counter-irritation should not be continued after pain is relieved. Dover's powder (gr. 10) will relieve both pain and sleeplessness. The milder hypnotics are usually ineffective, and when Dover's powder fails to bring sleep omnopon, gr. ½, is better than morphia. In the early stages its use is quite safe in the absence of cyanosis or much bronchial secretion. Paraldehyde is objectionable to take but generally regarded as safe. One to two drachms can be given in very sweet tea or two to three drachms stirred into two ounces of starch paste and given per rectum. In severe cases, with great excitement and struggling, hyoscine hydrobromide, gr. 1/100 to 1/50, is the only drug likely to take effect. In the later stages, when there is cyanosis and much secretion in the tubes, all drugs which cause sleep are unsafe. In such cases atropine will be useful. If gr. 1/100 does not give the desired effect it may be increased up to gr. 1/30. But in the grave cyanotic cases with much respiratory embarrassment ammonium carbonate (gr. 5 every two hours) is a valuable remedy. It may be increased up to gr. 10 hourly for six doses and then after an interval of a few hours the course repeated. Owing to its nauseous taste it should be given in milk. Raising the foot of the bed also helps the drainage of the bronchi.

With early specific treatment, feeding with glucose, rest, and fresh air, much can be done to avoid circulatory failure. The heart can be best helped by food and oxygen and the best food is sugar. With the slightest indication of anoxæmia oxygen should be administered through a rubber catheter passed into the nasopharynx. It is surprising that it is still often administered by the wasteful and futile method of the funnel. There is no evidence that digitalis is of any value for the treatment of heart failure in pneumonia except when auricular fibrillation is present. More can be said for its early use (℥ 10 to 15 three times a day), with the object of retarding the pulse. The heart, however, does not fail because of its rapidity but because of its intoxication. Heart failure does not stand alone, but is part of a general circulatory failure which is as much due to the action of toxins on the medullary centres as upon the heart muscle. In such a condition digitalis can do but little, and the same is true of strychnine, camphor, and caffeine. With a falling blood pressure pituitrin, ½ to 1 c.cm., or adrenalin (1 in 1000), minims 5 to 10, can be injected every six hours; the former is especially useful when there is tympanites. Recently synthetic drugs, such as coramine and cardiazol, have been introduced, and are worthy of trial as analeptics. Alcohol is the most used of all drugs in pneumonia and influenza. There is no scientific reason for its use, which is mainly traditional and due to the popular idea that it is a stimulant. Whilst in the early stages it may remove inhibitions due to pain, counteract restlessness, and induce sleep, its repeated administration helps to increase the degeneration of heart muscle and impairs resistance to infection.

The high mortality from the pneumonias will never be reduced by attempts to treat poisoned organs incapable of response, but only by early diagnosis and prompt measures to prevent intoxication. Expectant treatment in the early stages is apt to be followed by harmful drugging in the later.

W. H. WYNN, M.D., F.R.C.P. Lond.,
Professor of Medicine, University of Birmingham.

Special Articles.

THE NUTRITIONAL CONDITION OF THE EAST AFRICAN NATIVE.

BY J. L. GILKS, F.R.C.S. EDIN.,
DIRECTOR OF MEDICAL AND SANITARY SERVICES, KENYA;
AND
J. B. ORR, *D.S.O.*, *M.C.*, M.D., D.SC. GLASG.,
ROWETT INSTITUTE, ABERDEEN.

As the development of East Africa has proceeded there have been increased facilities for collecting information with regard to the physique and general health of the native race. It becomes evident as information on this subject accumulates that some of the conditions of malnutrition and lowered resistance to diseases which are being studied so intensively in Europe and America and are being ascribed to "deficiency" diets and faulty hygiene of modern civilisation, are not uncommon amongst African natives. Indeed, it may be stated here that disease in one form or another appears to be as prevalent among native races as among civilised peoples, and the problems of the prevention of disease are as acute as, and in many respects more difficult than, in Europe and America.

The only reliable data on the incidence of disease are the statistics on native labour employed on railway construction and the admissions to native hospitals. Observations by resident officers in the native reserves, however, seem to show that the diseases which are most prevalent amongst native workers, and in natives admitted to hospital, are also prevalent in the native reserves, so that this data may be taken as giving a more or less accurate indication of the incidence of disease in the native tribes from which the contract labour and hospital cases are drawn.

On the average, the mortality and sickness rate amongst railway construction labour has been in the past as high as in industrial areas in Britain. Thus, of a labour strength of 14,000 employed in the construction of the Uasin Gishu Railway in 1921, the death-rate was 46 per 1000, and the admissions to hospital for a period of six months for which records are available were 2892. The sickness rate has rapidly declined and is still declining. In 1924 the death-rate in native labour on railway construction was only 10·8 per 1000. This decrease is almost certainly due to improvements in the diet and hygienic conditions. The diet was made more varied and more like that consumed by Europeans by decreasing the amount of maize and increasing the amounts of legumes, vegetables, and meat. Even this lower rate—10·8 per 1000— is, however, high for selected men medically examined before being accepted for work. In the British army, the body of men in this country most comparable to the African contract labour, the death-rate in peace-time is only about 2 per 1000.

The Prevalent Diseases.

This high rate of sickness and mortality is not due to "vocational" diseases. Indeed, the diseases which are most prevalent among the native workers appear to be pretty much the same as those most prevalent among the rest of the population. The commonest diseases are those of the respiratory organs. These account for nearly 50 per cent. of the deaths from all causes. A large proportion of the cases are pneumonias. Pulmonary tuberculosis is common. In Mombasa in the years 1922, 1923, and 1924, it was second on the list of causes of adult mortality. The same high incidence of tuberculosis is found in Nairobi.

Ulcers, situated chiefly in the legs—i.e., the parts most liable to abrasion—are very common. In the construction of the Thika-Nyeri Railway, out of a labour strength averaging 4142, the cases of ulcers

admitted to hospital numbered 186, and the total number of hospital days required for the cure was 4054. The cases of ulcers which are encountered in the native reserves are frequently of a most severe type, and it is no uncommon thing to find that the ulcerative process has extended to the bone and that the resulting osteomyelitis has led to the formation of extensive sequestra.

Dysentery is also common. The infection is not usually amœbic, and bacteriological examination does not reveal the presence of the bacillus of dysentery. In 1925, out of a total of 66 cases examined at the laboratory in Nairobi, only six instances of infection with Shiga bacillus were detected and none with Flexner. A striking feature of dysentery among labour on works or estates is the frequency with which the disease appears among newly joined recruits. A parallel is found in the incidence of pneumonia among labour employed in the mines in South Africa. It is the newly joined men who go down most frequently. Those of longer standing, who incidentally have been fed for a longer period on a carefully adjusted diet, are relatively immune. In this connexion it is interesting to note that in the Katanga mines in the Belgian Congo it is the custom to draft newly recruited labour to a special camp where the men are fed properly to put them into good condition before they are allowed to work.

Cases of cancer are found in the native reserves. There are no figures to show whether or not it is as common amongst the natives as it is in Europe, as only a very small proportion of natives suffering from disease are seen by medical officers. It can be definitely stated, however, that cancer is by no means a rare disease. The myth that the primitive races of Africa do not suffer from cancer has been exploded years ago.

The Dietary.

The foregoing would indicate that the Kenya native is unduly susceptible to disease. The next point to consider is whether his dietary is such as should supply him with the requirements, as recognised to-day, for a healthy nutritional condition. The diets of the various tribes vary as widely as do their languages, and vary with their environment as well as with their particular customs and prejudices. Some have a diet almost as mixed as that of the European, and in the opinions of those best competent to judge, these were the most efficient carriers during the war. Among these may be mentioned the Kavirondo from the shore of the Victoria Nyanza, from whom is drawn what is widely considered to be the best labour in the colony. On the other hand, the tribes of the slopes of Mount Kenya live almost exclusively on a cereal diet. Little or no meat is eaten, and such as is consumed is largely on account of superstition or religion, indicating possibly a physiological craving. It is the elders who profit, as a rule, from the ceremonial meat-eating. The young men of the warrior class develop at intervals a meat-hunger; in fact there is a verb in the Kikuyu language indicating to become hungry for meat. A group will combine to purchase or obtain a bullock. The party adjourns to a suitable place where the bullock is slaughtered and eaten on the spot. Afterwards a period of abstinence from meat follows. Absence of meat from the dietary does not come about as a result of preference. Cattle and goats are valuable possessions, chiefly used in the purchase of wives; they cannot therefore be slaughtered in a light-hearted way for food. Every advantage is taken when an animal dies from natural causes. The carcass is regarded as a welcome addition to the menu and is disposed of accordingly. The result is reflected in the large total of cases of anthrax, which is returned every year in the official medical statistics. The physique of the Mount Kenya tribes is far from good, and it has long been considered that a dietary deficiency is at the root of the unsatisfactory condition which prevails.

Near neighbours of the vegetarians referred to above are the Masai, formerly the terror of East Africa. The Masai in his natural state lives almost entirely on meat, milk, and blood. The last is drunk fresh. As a labour force the Masai are negligible. Their interest is in cattle and nothing else, and apart from engaging as herdsmen they do not enlist for work. Not much is known as yet as to the medical or nutritional condition of the Masai who, perforce, adhere to their nomadic habits, but it has been reported that rheumatism and constipation are common among them. There are indications that the hitherto exclusively protein diet is being added to by carbohydrate in the form of maize meal, which is being obtained by purchase or barter.

The foregoing brief and incomplete sketch of the dietary habits of tribes in Kenya must be supplemented by allusions to customs which in themselves may indicate that deficiencies occur in connexion with the mineral constituents of the food. All over the country occur salt licks to which are driven the cattle after sojourn for more or less extended periods in other grazing areas. It is not, however, only the cattle who consume the earth found at these licks. Human beings take their quota, either eating it as it is found or steeping it in water and drinking the supernatant liquid, or using it to prepare food. The custom is not so largely followed as formerly. The earth is still seen exposed for sale in the market-places for administration to cattle or goats, but for humans its use is being largely replaced by the raw soda produced at Lake Magadi. The children in a Kikuyu market-place purchase their measure of Magadi soda, which they consume with the same gusto as do English children their pennyworth of sweets at a fair.

The Kavirondo add cow's urine to their milk before consuming it. A similar custom obtains among other African tribes. One is reminded of animals which, when deprived of minerals, drink the urine of each other.

Disease and Primitive Methods of Life.

The African native is thus by no means the "noble savage" that he is frequently supposed to be. He is prone to infectious disease and he is too frequently an individual of poor physique. The infantile death-rate, where it has been worked out in purely native areas, is somewhere between 400 and 500 per 1000. Granted that the native babies are given artificial food at a very early age in the shape of gruel or chewed-up bananas, and that this may have a great influence on the production of a high death-rate, yet may there not be a reason for the mother saying that "milk is not a food"? The real meaning may be that the milk produced by the mother is not of a quality sufficient to cause healthy growth in her offspring.

The information, so far as it goes, seems to suggest that at least amongst some of the tribes the native population is no better physically and no less susceptible to disease than Britain's C3 population. Vegetarian diets, such as that used by the Kikuyu, even when accompanied by abundant sunshine on a half-naked body, is evidently no guarantee of health and no sure prevention against diseases such as tuberculosis and cancer, which are sometimes attributed to lack of sunshine and the use of the refined foodstuffs of civilisation. A study of the conditions in one of these reserves, where the infant mortality is so much higher than that of Britain, where women suffer from senile decay at an age when British women are approaching their prime, and where, in addition to malaria, yaws, and diseases due to intestinal parasites, the worst diseases which affect the people of civilised countries are also prevalent, affords no support for the view that the adoption of the dietary habits and the primitive methods of life of the African native would lead to the elimination of disease.

These problems of the nutrition of the native have received more than local attention. Through the

good offices of the Empire Marketing Board it has been possible to obtain the coöperation of experts in nutrition in Britain. A Committee, consisting chiefly of members of the Nutrition Committee of the Medical Research Council and medical representatives of the Colonial Office, have outlined a scheme of investigation on problems of nutrition among the native races of Kenya. Two research workers have been sent out from the Rowett Institute, and experienced officials of the Kenya Medical Service will coöperate with them in carrying out investigations to determine whether there is any correlation between diet and diseases in the natives.

SOCIAL CONDITIONS AND ACUTE RHEUMATISM.

REPORT ON INVESTIGATIONS IN LONDON AND GLASGOW.

IF the factors determining the greater incidence of acute rheumatism in the hospital class, as compared with the well-to-do, could be ascertained, steps might be taken to prevent its occurrence and moreover some light might be thrown on the causation of the disease.

This was the starting-point of a searching inquiry made simultaneously in London and Glasgow under the auspices of the London Committee for Child Life Investigation, over which Dr. G. F. Still presides. This is one of the standing scientific committees appointed by the Medical Research Council; its members include Dr. John Brownlee, Dr. H. C. Cameron, Dr. J. S. Fairbairn, Mr. Eardley Holland, Dr. R. C. Jewesbury, Prof. M. S. Pembrey, and Dr. O. L. V. de Wesselow, who acts as secretary.

Dr. Still, in an introduction to the report[1] of the results of the investigation, sets out the reasons why it seemed worth while to make a thorough survey of the conditions under which rheumatism arises, the parentage, the family incidence, the environment, especially as to housing, clothing, and cleanliness; also the physical characteristics of the children affected, especially as regards the state of the throat. It was not practicable to obtain for comparison any sufficient statistics on similar lines from families of the well-to-do, so it was decided as far as possible to check the results obtained by comparison with non-rheumatic families of the hospital class. These families were selected only in that each contained a child attending the hospital for a non-rheumatic disease, and are termed "control families."

The Data of the Investigation.

The data on which the investigation is based consist of the medical and social histories of 721 families containing at least one child who is, or has been, under treatment for rheumatism. Of these, 121 histories were compiled at the Children's Hospital, Great Ormond-street, London, 200 at the Royal Hospital for Sick Children, Glasgow, and 400 at St. Thomas's Hospital, London. For comparison with these "rheumatic families" the histories of 200 "control families" were investigated, 100 at the Royal Hospital for Sick Children, Glasgow, and 100 at St. Thomas's Hospital, London. In addition, the rheumatic histories of some 2000 children residing in Poor-law schools were ascertained.

It is made clear at the outset that throughout the report the term rheumatism is used to indicate only the disease sometimes known as rheumatic fever or acute rheumatism, with its recognised manifestations. Vague aches and pains or tonsillitis were not accepted as evidence of rheumatism, and none of the forms of so-called rheumatoid arthritis were admitted, since there is no reason to suppose that they have any connexion with the disease under investigation. At St. Thomas's Hospital, under arrangements made by Dr. J. S. Fairbairn and Dr. O. L. V. de Wesselow, the children were examined by Dr. C. K. J. Hamilton and Dr. J. Forest Smith. Inquiries into the social history were made concurrently by Mrs. M. Forest Smith. The second series at the Hospital for Sick Children, Great Ormond-street, London, was examined by Dr. F. J. Benjamin, working under Dr. Still, the social inquiries here being made by Miss Little. In Scotland, Dr. Margaret F. Lowenfeld and Dr. H. W. Sutherland, worked under Prof. Leonard Findlay at the Royal Hospital for Sick Children, Glasgow. The supplementary inquiry into rheumatism in Poor-law schools was made by Dr. Benjamin.

The mass of observations made by the three groups of workers were reduced to a connected report by Mrs. M. Forest Smith, and Dr. J. Brownlee and Dr. Matthew Young have tested the statistical significance of the results. The Council express special appreciation of the aid given by Dr. de Wesselow.

Dr. J. A. Glover helped in obtaining figures and information as to buried rivers and old watercourses, and the medical officers of health for many London boroughs supplied records of the measurements and sanitary conditions of houses.

Scope of the Inquiry.

The scope of the inquiry included the incidence of rheumatism in rheumatic and control families, among living and dead children, the hereditary aspect being specially studied. The incidence of sore-throat in rheumatic and control families, the condition of the throat in rheumatic and non-rheumatic members of these families, and the results of throat operations sustained by the rheumatic members of rheumatic families were ascertained. Evidence of infectivity was also sought, the possibility of infection from sleeping with a case of rheumatism, instances of the occurrence of rheumatism in persons in close contact with rheumatic patients, and the incidence of rheumatism in families of different size being considered.

In order to discover the effect of poverty, hospital patients were divided into three social classes, and the incidence of rheumatism investigated in each class. Social points studied included, as factors concerning the child, conditions of life, maternal care, degree of subjection to exposure, sleeping accommodation, clothing, cleanliness, and distance from school; as factors concerning the parents, their characteristics, birthplace, general condition, occupations and incomes. The types of housing, position of rooms occupied, aspect of rooms and houses, number of rooms per family, number of persons per room, ventilation, lighting, air space per person, sanitation, vermin, dust, dampness, locality—all came within the purview of the investigation.

The seasonal incidence of rheumatism and even the incidence of rheumatism in relation to pigmentation of hair and eyes was studied, while the incidence of rheumatism in four Poor-law schools visited was compared with its incidence, as found by other observers, among children attending public elementary schools.

General Conclusions.

It is admitted that the conclusions drawn from this exhaustive survey are mainly negative, but a few definite findings emerge. The details must be sought in the report. Some of the general conclusions drawn by Dr. Still in the final chapter of the report are set out below:—

Family Incidence.—There was found to be clear evidence of family incidence; rheumatism was common in the parents or brothers and sisters of the rheumatic child. This might indicate inheritance of the disease or of some special tendency to the disease; but, on the other hand, it might be due to similarity of environment, or again it might be due to contagion.

[1] Medical Research Council. Special Report Series, No. 114. H.M. Stationery Office. Pp. 108. 2*s*. 6*d*.

Heredity.—No sufficient evidence of heredity was forthcoming. A history of rheumatism in grandparents can seldom be verified; parental rheumatism can be ascertained with a nearer approach to accuracy. Careful inquiry showed that rheumatism had occurred in the father or mother in about 20 per cent. of the rheumatic families; but in the control families there was also parental rheumatism, less indeed but still in one set of figures as high as 17 per cent., in another 11 per cent., so that it may be doubted whether the excess of parental rheumatism is sufficient indication of heredity.

Infection or Contagion.—The relation of rheumatism and its family incidence to environment has occupied the greater part of the investigation. The question of infection or contagion is necessarily closely connected with that of environment. In view of the heavy incidence of rheumatism upon children of the hospital class as compared with that upon children of the wealthier classes, it might be expected that the incidence of rheumatism amongst the former would be in direct relation to the degree of poverty. This, however, was found not to be the case; indeed, if the hospital patients are divided into three classes according to the degree of poverty, the poorest of these three, the very poor and destitute, show a lower incidence of rheumatism than the other two. It would seem, therefore, that if poverty is a factor in the incidence of rheumatism it must be on account of some condition or conditions associated therewith which are not equally present in all degrees of poverty.

A comparison between the rheumatic and non-rheumatic children in respect of home conditions seemed to show that in the rheumatic families the maternal care was less good, and therewith exposure to cold and wet was more common and clothing less satisfactory. The housing inquiry threw but little light on the problem; dampness which has generally been credited with playing a large part in the causation of rheumatism was only slightly more frequent in the houses of the rheumatic families than in those of the others. Overcrowding of rooms did not seem to be commoner amongst the rheumatic families than amongst the controls, nor was there any appreciable difference between the two as regards sanitation in London, but in Glasgow the proportion of rheumatic families living in houses with bad sanitation was appreciably larger. Neither ventilation nor lighting appeared to be any worse in the homes of the rheumatic families than in those of the controls.

These findings are based upon a comparison between the families of rheumatic children and those of non-rheumatic children, all of the hospital class; it may be that an investigation of the conditions under which the rare occurrence of rheumatism takes place in the children of the well-to-do, whose environment is less similar, would throw into more prominence any common factor of causation. If rheumatism is due to infection its incidence may be determined by special frequency or closeness of exposure to infection, or by some condition in the particular children concerned rendering them especially susceptible to infection. With regard to the former, in the absence of any certain knowledge as to the mode of conveyance of infection, it was decided to investigate the frequency of exposure to some of those sources of infection which are recognised as responsible for other diseases. The presence of vermin such as fleas, bugs, body-lice, and head-lice was found to be not more frequent in rheumatic families than in others; sanitation in the London area was no worse in the houses of the rheumatic than in those of the control families.

The possibility of direct contagion from person to person is difficult to exclude. If it occurred it would go far to explain the greater frequency of rheumatism amongst the children of the poorer class than amongst those of the well-to-do, for the former live under conditions of much closer contact. In the homes of the hospital children it was found that commonly two children and often three or more slept in one bed.

Inquiry showed that in many instances a rheumatic child shared a room or a bed with a sister or brother or that a rheumatic parent slept in the same room with the children. It could not be proved that infection had occurred in this way; on the other hand, individual instances were noted in which it seemed at least possible that the disease had spread in this way from one child to another. The question is not an easy one to determine, for even if, in the chronic stage which many of the children had reached, there was no apparent spread to other children by contact, it is still possible that in the earlier and more acute phase there may be a time at which spread by contagion is possible; moreover, contagion if it occurs may be indirect; it is conceivable that a room or a house may be infected by some occupant, particularly, perhaps, by one who was there in the early acute stage of the disease. It was hoped that this point might be investigated, but it was found impracticable to ascertain in any sufficient number of cases the antecedents in the house. Clothes also might be a source of infection, and it was noted that there was less individual proprietorship of clothing amongst the children seen at hospitals than is usual amongst the well-to-do. The time relationship of the onset of rheumatism in two or more members of the same family was in individual instances suggestive of the possibility of contagion direct or indirect.

On the whole, while it cannot be said that there is, in the facts collected, any conclusive evidence of contagion, many of them are consistent with this view.

An unhealthy throat was noted in a higher proportion of rheumatic children than in non-rheumatic; the difference, however, was not very large. It is perhaps significant that amongst the children in the Poor-law institutions in the London area the proportion of healthy throats was much higher than amongst children of the same class living in their own homes in London. This suggests that environment plays some part in the production of unhealthy tonsils, and that this is one direction in which environment affects the incidence of rheumatism. The effect of tonsil operations was investigated. It was found that neither cutting nor enucleation was any guarantee of immunity from rheumatism; out of 295 rheumatic children who had had their tonsils surgically treated, 129—i.e. 43·7 per cent.—developed their rheumatism for the first time subsequently, and this although in about half the number the treatment had been complete enucleation of the tonsils.

Whilst therefore an unhealthy state of the tonsils may favour the onset of rheumatism, it is clearly not an essential factor. Statistical evidence seems to confirm the association between unhealthy tonsils and rheumatism, though it does not prove that the rheumatism is a result of the tonsil condition; the converse indeed might be true. If, however, the unhealthy state of the tonsils is to be regarded as causal, such a view would be consistent with an infective agent as the essential cause of rheumatism and would not exclude the possibility of contagion. Indeed, on the analogy of other infective diseases it makes intelligible the possibility that close contact would favour the transmission of the disease.

Notification.—Possibly more light might be thrown upon the question of the spread of rheumatism, whether by contagion or otherwise, if it were made a notifiable disease. This would at any rate secure information as to its prevalence and distribution, matters of practical importance if institutional treatment upon a wide scale is desirable for children with rheumatism. The difficulty of notification would be considerable, for the diagnosis of the more characteristic manifestations of rheumatism, heart disease, and chorea, and even the acute articular affection, is by no means free from possibilities of error, and in its less pronounced forms rheumatism may be very difficult to diagnose.

In the meantime it appears from this inquiry that although it is difficult to point to this or that fault of environment as responsible for rheumatism nevertheless it is by raising the standard of environment, improving the home conditions so that they approximate to the well-ordered conditions found in such institutions as those in which rheumatism was found to be much less common, and probably by reducing crowding, so that the possibility of contagion may be diminished, that we may hope to reduce the frequency of rheumatism in children.

MEDICINE AND THE LAW.

Miner's Nystagmus: Proneness to Recurrence.

A MEDICAL referee under the Workmen's Compensation Act occasionally encounters difficulty in certifying an industrial disease which is prone to recurrence; the symptoms are found to be present at one date but not at another, and the question arises of the continuance of the disease. This difficulty occurred in a case lately decided by the House of Lords. A miner, employed for 35 years in a colliery, was certified in July, 1923, to be suffering from nystagmus; an appeal against the certificate to a medical referee was dismissed. He received 35*s.* weekly compensation under the certificate for three weeks; afterwards he was given light work above ground. A year later he was again certified to be suffering from nystagmus; for a month he received compensation, then went back again to light work. In February, 1925, the county court registrar made an order for his examination by the medical referee, who was asked to certify as to his condition and fitness for employment, to specify (if necessary) the kind of employment for which he was fit, and to say whether the incapacity was due to the industrial disease and whether he was fully recovered from the nystagmus. The medical referee did not answer all these questions categorically. He certified that the man was not suffering from miner's nystagmus, that he was hypermetropic and had incipient cataract, that his condition was such that he was fit for surface work, and that his condition was not due to nystagmus. Fortified by these findings the colliery proprietors ceased to pay compensation. In July, 1925, however, the miner was again certified to be suffering from nystagmus. Appeal from the certificate was dismissed, the referee certifying that the workman's present condition was that he had nystagmus and also lens opacities. Four months later the workman applied for arbitration, but the colliery denied liability on the ground that the certificate of February, 1925, was final and conclusive, and that the workman could not go behind it. The county court judge had evidence before him that nystagmus was an industrial disease which comes and goes, and that at the moment of the county court hearing the workman was incapacitated by nystagmus. The medical referee, it was true, had been asked in February, 1925, to say whether the man had recovered from the disease, and he had answered that the workman was not then so suffering, but he had not reported that the workman had fully recovered. The county court judge did not feel himself debarred by the certificate of February, 1925, from finding that the workman was in fact suffering from nystagmus at the moment, and he awarded the man compensation at the rate of 10*s.* a week. There is good legal authority for saying that a certificate is conclusive only of matters referred to therein as at its own date, and is not to be taken as amounting to *res judicata* between the parties. Following this authority the Court of Appeal upheld the judge's award and said he was justified in inferring from the later certificate that the workman had a special susceptibility to nystagmus which had broken out after the earlier certificate. The House of Lords concurred and dismissed the employers' appeal. Their lordships said the medical referee's certificate of February, 1925, did not certify that the workman had fully recovered from the original attack though the medical referee had been expressly asked to report upon this point. The certificate meant only that the symptoms of nystagmus were not apparent at that time and that there was at that time no incapacity due to nystagmus. As the county court had uncontradicted evidence before it that nystagmus came and went, the county court judge was entitled to hold that the workman was at the date of the hearing suffering from the disease originally contracted in 1923.

Hospital Treatment and Poor Relief.

If anyone, treated as a private patient in a hospital maintained by the guardians out of the rates, pays for the whole of the treatment out of his own pocket, can he be said to have received poor relief? The significance of the question is that the acceptance of union or parochial relief disqualifies a guardian from holding office. The point came before the Divisional Court and (on appeal) the Court of Appeal in January. The proceedings—as often happens in local government litigation—sound a little complicated. They took the form of an application by an elector for an order of the Court to direct the Dartford Guardians to show cause why a writ of mandamus should not issue to command them to declare vacant the office of guardian held by a lady who, since her election as guardian, had received—it was suggested—"union or parochial relief." The ground of the application was that the lady had been a private patient in the King Edward Avenue Hospital, Dartford, which was maintained by the guardians out of the rates. An operation was performed upon her by her own doctor, who attended her subsequently at the hospital; the anæsthetic was administered by the medical superintendent of the hospital, who was not a whole-time officer, but was paid a separate fee by the guardians for his services. The lady paid for her conveyance to the hospital and for the whole cost of her maintenance and treatment there; but the applicant in the Divisional Court said that the facilities she received made her technically a pauper, a view said to be accepted by most boards of guardians and not openly repudiated by the Ministry of Health. Private patients, of course, were not admitted to this hospital at Dartford if such admission would interfere with the treatment of other patients by way of poor relief.

Lawyers have expressed doubt whether the treatment of a private patient for payment in a rate-maintained hospital was to be regarded as a privilege or advantage which amounted to the receipt of poor relief. Four years ago (in the case of Chard *v.* Bush) Mr. Justice Sankey held that the receipt of money from the local authority by way of loan amounted legally to poor relief. This was because the Acts which were material in that case repeatedly spoke of "relief on loan" and "relief by way of loan." In the recent Dartford case Mr. Justice Salter said that, as the guardians had been paid in full, there was no evidence on which the lady could be said to have received "union or parochial relief" within the meaning of the Local Government Act. The Court of Appeal upheld this decision. The grant of the writ of mandamus is discretionary, and the superior Court saw no reason to interfere with the discretion exercised by the Court below. Modern statutes usually deal carefully with matters of disqualification. For instance, the Housing (Rural Workers) Act, passed last year, saves the position of a member of a local authority who receives a grant or loan under the Act; but he must not vote on any resolution or question relating to a house or building in which he is interested.

Certificate of Cause of Death: Apparent Insufficiency of Information.

The Births and Deaths Registration Act of 1874 lays down that "in case of the death of any person who has been attended during his last illness by a registered medical practitioner, that practitioner shall sign and give to some person required by this Act to give information concerning the death a certificate stating to the best of his knowledge and belief the cause of death." The recently passed Births and Deaths Registration Act of 1926, which comes into operation on July 1st of this year, does not substantially change the position. From time to time doubt arises how far a doctor who has attended a patient has sufficiently recent knowledge of the case to be able to certify the cause of death. At an inquest at Lewisham the coroner for South-East London has lately had occasion to express this doubt

rather sharply. A man aged 67, previously engaged in the trade of organ-building, was treated last September and subsequently for atrophy of the hands. One morning he was found dead in bed. The widow appears to have attempted to communicate by telephone with the specialist who had treated the deceased; it was found that the specialist was absent in France. Communication was established by the aid of the aeroplane post, and by this means a certificate was obtained which purported to state that death was due to progressive muscular atrophy. Major W. H. Whitehouse, the coroner, had before him at the inquest the evidence of Dr. T. E. White, of Catford-hill, to the effect that death was due to hæmorrhage from gastric ulcer. The coroner asked the widow how a doctor living in France could know that her husband had died from progressive muscular atrophy. She agreed that the specialist had not seen her husband during the last week nor since the death. Major Whitehouse recorded a verdict of death from natural causes and remarked, with regard to the certificate which had been produced at the inquest, that it was the most irresponsible thing he had ever met with.

The court was not, of course, aware of anything which the absent practitioner might have had to say in justification of an opinion expressed no doubt in perfect good faith and perhaps given, in the hurry of the circumstances and at the urgent instance of the relatives, without the usual care. The incident shows the danger of certifying the cause of death without adequate and recent information.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Legislation against Venereal Disease.

AFTER long Parliamentary debate the new Bill for the control of venereal disease has become law. Persons suffering from these infections will now be obliged to have themselves attended by a medical man, guardians being made responsible for the treatment of wards and minors. For paupers and people who are not obliged to belong to a sick-club and are unable to pay for medical attendance, the local health authority will have to make arrangements. Anyone suspected of suffering from venereal disease may be directed by this authority to submit a medical certificate that he is healthy, and if he does not comply with this demand he may be examined by a medical officer. The law, however, expressly forbids the authorities to consider anonymous communications. Sexual intercourse by a person who knows that he or she suffers from a venereal disease may be punished by imprisonment up to three years, and similar penalties may be inflicted on anyone who is infected and who marries without mentioning the fact to the other party to the marriage. In these cases no official action is taken except on the special request—which may afterwards be withdrawn—of the injured party. Medical attendance on venereal disease is allowed only to medical men or women, and medical advice without examination is forbidden and may be punished by imprisonment and fines. An unqualified person attending venereal patients is liable to suffer the same consequences, whilst patients who interrupt their course of treatment before being declared cured by their medical attendants are liable to have their names reported to the local health authority. Medical and other Government or municipal officers are bound to keep strictly secret the fact that a person is suffering from a venereal disease, and those who disregard this obligation may be given a year's imprisonment as well as being fined. Advertisement of remedies for the cure of venereal disease is not to be allowed except in medical and pharmaceutical journals. Public lectures on the dangers of venereal diseases are permitted provided that they are held only for purposes of instruction. The Act further makes the following persons liable to 12 months' imprisonment and a fine: (1) A wet-nurse who before being employed conceals the fact that she is suffering from a venereal disease. (2) People who allow a syphilitic infant to be nursed by anyone other than its mother or a syphilitic nurse. (3) Those who allow an infant suffering from venereal disease other than syphilis to be nursed by a wet-nurse without informing her of the fact and without providing for prophylactic measures. (4) Those who give a child suffering from a venereal disease to foster-parents without informing them that it is infected in this way. A wet-nurse before being employed must in future produce a certificate of health. The Act finally prohibits brothels and contains provisions for the housing of prostitutes.

This new legislation certainly restrains the personal liberty of the individual for the sake of the community to an extent hitherto unknown in this and many other countries. Its principal feature is that henceforth men and women will be subjected to the same rule so far as the spread of venereal diseases is concerned; until now a man could not be punished for his misdeeds, whereas a woman could eventually be registered as a prostitute and suffer all the consequences of that registration. It is satisfactory that quacks are expressly excluded in the above Act from any form of attendance on venereal patients; this provision, indeed, caused a good deal more debate in Parliament than many of the other provisions of this very incisive Act.

Can a Qualified Medical Man Practise as a Quack?

The existing laws governing medical practice sometimes lead to rather ridiculous results. According to the regulations a qualified medical man, before beginning practice in any district, has to call personally on the district medical officer of health and show his diplomas; he is thereupon registered in the district, and his registration notified to the central authority. People without qualifications, if attending patients for money, have also to present themselves to the medical officer of health for purposes of control. The financial success of many unqualified persons has caused a certain number of medical men to settle as quacks, and recently one of them presented himself to the district medical officer without mentioning that he had a regular qualification. When this was discovered he was prosecuted for having broken the regulations of medical practice. The defendant pleaded that he had intended to make no use of his qualification and would have abstained from treating diseases and from prescribing any drugs which must only be dealt with by the medical profession. The Supreme Court of Prussia held that a medical man before beginning practice must certainly show his diploma to the competent authority. Even if he intends to practise not according to the methods of scientific medicine but of quackery, he must, nevertheless, follow the laws and regulations concerning the medical profession. Should he desire to make no use of his diploma he may only do so by an express statement of his intention. Whether a medical man can altogether renounce a qualification duly obtained the Prussian Court was unable to decide, for this matter falls under the jurisdiction of the Imperial Court.

Statistics of Diabetes.

Dr. Ullmann lately read before the Society for Internal Medicine a paper on the frequency of diabetes. Notification of diabetes not being compulsory, nothing more than the mortality which it causes can be ascertained, this being estimated from the statements on death certificates. During the late war the mortality from diabetes was decreasing, not only amongst the belligerents but also in neutral countries such as Switzerland; in Berlin it fell from 23 per cent. in 1913 to 11 per cent. in 1920. Undoubtedly restriction of diet contributed to this decrease, especially in Germany, which suffered most of all from shortage of food. Even in the United

States of America, where there was but little control of food, there was a small decrease. In rural districts, where food was not, of course, so scarce as in the towns, the lowered death-rate was less marked. The statistical records of Europe and the United States have made it obvious that since the middle of 1921 diabetes has again been on the increase. It is not nervous strain which causes the disease, but lavish nourishment with too little bodily exercise. Sports is a prophylactic against it. It is remarkable, however, that women now contract diabetes more often than formerly. In the discussion Prof. Beugsch stated that in one-third of the cases a hereditary factor could be traced. He thought that the prevalence of the disease was a symptom of degeneration in the population. The severe forms of diabetes in young people have not increased; it is amongst adults that the condition is growing more common.

A New Medical Journal.

To the great number of German medical periodicals a new one has recently been added under the name of the *Medizinische Welt*. The editors are Dr. Dietrich, late director of the Prussian Medical Department, and Dr. Beyer and Dr. Ostermann, at present officers of the department. In their introductory article they explain that the new journal is especially intended for the average practitioner who is not in a position to read the detailed articles in the great scientific journals. They will therefore lay stress on shorter articles without long lists and description of experiments, and will deal with medical research, practice, politics, instruction, technique, and medical news in general. Three numbers of the new journal have so far been issued; it is well printed and contains numerous illustrations, including photographs of the authors of the principal articles.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Effect of Euphyllin on Respiratory Paralysis.

Dr. Vogl has reported to the Gesellschaft der Ärzte on his investigations into the effect of euphyllin (theophyllin and ethylene diamine) on cases with diminished excitability of the respiratory centre and cerebral cortex. Whilst injecting euphyllin intravenously to increase diuresis, he found that the volume and rate of breathing were markedly increased. Experiments on himself showed that this increase could not be voluntarily controlled, and he found that the drug gave very satisfactory results in patients who had Cheyne-Stokes breathing. A few seconds after intravenous injection the rhythm became regular and this effect sometimes lasted for as long as 60 hours. In cardiac dyspnœa the feeling of oppression was rapidly relieved, and in conditions of coma—e.g., narcotic intoxications—the patients could be recalled to life almost instantaneously. It seems, therefore, that we may have in euphyllin a useful analeptic for use in cortical paralysis. As the substance has a very powerful effect on the circulation, it is not quite certain whether its rapid action is not due to a combination of cerebral and circulatory stimulation. Experiments by Guggenheimer, Elias, and others seem to point to a double plane of attack. But in cases of uræmia, apoplexy, and cerebral tumour, in which circulation was not disturbed, the effect was just as prompt, and Vogl therefore thinks that the cortex is the true seat of the drug's action. However this may be, it now appears that we have a remedy which is able to abolish Cheyne-Stokes's respiration as quickly as morphia abolishes cardiac asthma.

The Campaign against Vivisection.

The Vienna Society for the Prevention of Cruelty to Animals has again been giving a lot of attention to the old problem of vivisection. The public has been pressed to take action to stop all experiments on animals in this country, but as these are performed only in university laboratories and institutes, and only by competent investigators, the reason for the Society's sudden activity was not at first evident. The precautions required both by the Government and by the University do not allow any true vivisection—that is to say, bloody or mutilating experiments on living creatures—without sufficient anæsthesia, and an anæsthetic is required by law, except where lower animals such as frogs are used. On the other hand, the law does not prevent research laboratories from using mice, rabbits, cats, and dogs for testing vaccines and serums, this not being regarded as vivisection, and it has become evident that the campaign, conducted by the Society for the Prevention of Cruelty to Animals, was only a sham fight, being mainly aimed against vaccination, which is almost compulsory in this country. The Society's circuitous plan was to make the preparation of calf's lymph unlawful under the guise of forbidding vivisection, but, of course, the medical authorities lost no time in telling the public what all this implied, and the attack upon the liberty of teaching and research has definitely failed.

Nutrition and Lithiasis.

At the last meeting of the Vienna Medical Society Prof. Tadasu Saiki, of the University of Tokio, read an interesting paper on the correlation between malnutrition and disease, and demonstrated a series of calculi taken from the kidneys, bladder, and gall-bladder of animals fed on a diet free from vitamin A. Whereas in human beings deprivation of this vitamin leads chiefly to osseous changes, the effect on animals is often to produce lithiasis. The extraordinary thing is that, according to Dr. Saiki, these can be made to disappear if the animals are again given an adequate supply of the missing vitamin; the stones are apparently redissolved. In another series of experiments at the Japanese Institute of Nutrition (of which Dr. Saiki is the director) the animals were fed on food not free from vitamin A, but poor in it. It was found that after a long period—up to 280 days—these animals developed an induration of the tissues, whilst in several instances formation of distinct cancer tissue was noted. These experiments seem to support the old theory that organs undergo malignant changes as a result of insufficient nourishment. In the discussion which followed, Prof. Pirquet, who translated Dr. Saiki's address from English into German, pointed out that this Japanese research ought to be followed up in the areas known as "stone districts." It would be very interesting if it were shown that the food of the people in these districts was deficient in the way suggested.

Spread of Influenza in Austria.

For some time almost the whole of Central and Western Europe has been the hunting-ground of influenza, and the epidemic has at last reached Austria. There are now over 30,000 cases here, but the mortality is happily very low. The present *genius morbi* is characterised by sudden high pyrexia (over 40° C.), great prostration, and rapid recovery, whilst an intense hyperæmia of the fauces and inflammation of the upper respiratory passages are always present. A frequent complication is otitis of a mild type, and also suppurative inflammation of the accessory nasal sinuses. Apart from influenza, we are at present suffering from an outbreak of measles, which is of rather severe type, and commonly leads to aural and pulmonary complications.

The Value of X Rays in Diseases of the Ear.

At a recent meeting of the Vienna Society of Rontgenology Dr. Otto Mayer dealt with radiographic examinations of the temporal bone. This has two objects—namely, to define the anatomical structure of the bone and to ascertain its pathological condition. The anatomical structure can be made out very definitely, and before operating the surgeon can get exact information about the position of the sinus sigmoideus, the aeration of the mastoid process, and the presence of solitary air-cells. To find out how much destruction has been wrought by an acute

or chronic otitis is only possible if the radiographic appearances are correlated with the clinical findings, which is true, of course, of other investigations with X rays. At the Vienna Otological Clinic it has for several years been the practice to take a radiogram in every case of inflammation. In severe cases, when the question of operation or conservative treatment is raised, the X ray findings are decisive. In the difficult cases of otitis with few or no symptoms such an examination will often convince patient and surgeon that active interference is required, whilst in other cases it may show that disturbing symptoms arise from some other cause. Less importance is attached to radiography in non-surgical diseases of the ear, for the appearances seen in otosclerosis or catarrhal deafness are not by no means characteristic. There is no doubt, however, that in otology much information concerning pathological processes can be gained by coöperation of the radiologist with the physician and the surgeon.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Duties of the Coroner.

THE Coroners (Amendment) Act, which has recently received the assent of the Governor-General of the Irish Free State, has made several important modifications in the law. The duty is laid upon the coroner to hold an inquest on a body lying in his district when there is reasonable cause to believe that the person has died a violent or unnatural death, or has died a sudden death of which the cause is unknown, or that he has died in prison or in such place or in such circumstances as to require an inquest under any Act other than the Coroners (Ireland) Act, 1846. Secondly, in other cases than those just recited, when the coroner is informed of the death within his district of a person who was not attended in his last illness by a qualified practitioner, or in regard to whom a medical certificate of the cause of death is not procurable, he may inquire into the circumstances of the death of such person, and if he is unable to ascertain the case of death he may, if he thinks fit, hold an inquest. In case of these inquiries being made, he is empowered to order fees to be paid for any investigation, including a post-mortem examination, undertaken at his request by a medical practitioner. The maximum fees payable to medical practitioners, both for post-mortem examinations and for giving evidence, are: (1) for giving evidence without making a post-mortem examination, two guineas; (2) for making a post-mortem examination and reporting the result thereof, without giving evidence, three guineas; (3) for making a post-mortem examination and giving evidence, four guineas. Provision is also made by which the Minister for Justice may, on request from the coroner, make arrangements to supply him with expert assistance.

With certain specified exceptions, which cover most cases from which a criminal charge might arise, the coroner may hold an inquest without a jury. The number of the jury in other cases is to be not less than six, nor more than 12. Moreover, in the event of disagreement, if the minority be not more than two, the coroner may accept the verdict of the majority. In other cases of disagreement he must summon a fresh jury and begin the inquest again. The duty of visiting the body is taken off the jury and put on the coroner. In cases where a coroner has reason to believe that a death has occurred in or near his district in such circumstances that an inquest ought to be held, while, owing to the destruction of the body by fire or otherwise, or to the fact that the body is lying in a place whence it cannot be recovered, the ordinary procedure cannot be followed, he may report the circumstances to the Minister for Justice, who may, if he thinks fit, direct an inquest to be held.

An important change is made to avoid the inconvenience of a coroner's inquest and a magisterial investigation being held simultaneously in regard to the same occurrence. In the event of the coroner being informed that any person has been charged with the murder, manslaughter, or infanticide of the deceased, he shall adjourn all further proceedings until the criminal proceedings have concluded, when he may, if he thinks necessary, resume the inquest. It is made the duty of every council which has power to appoint a coroner, within 12 months from the passing of the Act, to consider, and if it seems desirable, alter the salary or salaries of the coroner or coroners appointed by such council, always provided that the salary of an existing coroner shall not be diminished.

It will be seen that the various changes made by the Act all tend to render the functions of the coroner more useful to the community.

County Medical Officers of Health.

A deputation from the General Council of County Councils waited on the Minister for Local Government and Public Health last week to discuss the appointment of county medical officers of health. Senator P. Kenny, who introduced the deputation, stated that the General Council of County Councils had, in 1923, approved of the appointment of these officers. In doing so they followed the recommendations of the Irish Public Health Council, which suggested that half the cost should be borne by the State and half by the county councils. The Act of 1925, however, put the entire cost on the county councils. There was a heavy financial strain on the councils at present, and he asked that the question of dividing the cost between the State and the local authorities should be reconsidered. In reply, the Minister (Mr. James Burke) recognised the fact that the present opposition of the councils was due to a temporary difficulty. He had no desire to press hardly on them, but as the Act had been passed, it was his duty to enforce it. The present medical officers were not able to cope with the situation, particularly as regards the preventive side of the medical service. When fevers broke out the local officers had not got adequate machinery to deal with them. Then there was the commercial aspect, which would become more important as time went on. At present Irish produce enjoyed a very favourable position in the English market, but there was a tendency to criticise the conditions under which foodstuffs were produced. If the standard of inspection in the Free State was not raised to the level of English inspection it was quite possible that their produce would be put under a ban, particularly pork and butter. The Minister stated that any additional expense above the salary of the medical officer would be shared equally by the State.

DONATIONS AND BEQUESTS.—Mr. John Daniel Rowlands, of Cardiff, left £1000 to Cardiff Royal Infirmary.—Mrs. Mary Jane Gibbons, Newcastle-on-Tyne, left £300 to the Home for Destitute Crippled Children, Salters-road, Gosforth; £500 each to the Royal Victoria Infirmary, Newcastle-on-Tyne, and the Wesleyan Missionary Society; £300 each to Müller's Orphanage, Bristol, the Northern Counties Orphan Institution for Boys and Girls, the Fleming Memorial Hospital; and £210 to St. Dunstan's Home. The residue of the property for distribution among such charities as the executors shall determine.—Miss Mary Sarah Phillips, of West Mall, Clifton, Bristol, besides many other bequests, gave £1200 to the Bristol Royal Hospital for Sick Children and Women; £1500 to the National Lifeboat Institution for a boat to be named the "Augustus Phillips"; £100 each to the Bristol Royal Infirmary and the Bristol General Hospital; and £300 to Dr. Watson Williams and his wife "in deep appreciation of the great and unfailing goodness during my long and serious illness."

Correspondence.

"Audi alteram partem."

THE TREATMENT OF HERNIA.

To the Editor of THE LANCET.

SIR,—Prof. E. M. Cowell, in his Hunterian lecture on Hernioplasty, has raised some interesting points, for the question of the recurrence of hernias after operation seems to be somewhat in the air at the present moment. There is, however, one point in Prof. Cowell's method of treatment which he does not make clear. On what principles does he choose his patients for performing his "flap operation"? The fact that he has done the operation 201 times in the course of two years seems to imply that he employs his method as a routine in all cases. But if so, is this really necessary? I think most surgeons are agreed that for the great majority of patients, that is to say for those with an ordinary oblique hernia, the removal of the sac is the prime necessity and that if this is done properly the details of the rest of the operation are comparatively unimportant. It would be unnecessary, therefore, to perform a hernioplasty as a routine. In my own experience recurrences of hernia have been usually due to a failure either to remove the sac or to realise that the hernia was direct.

Prof. Cowell also implies that the operation of fascia suture as described by Gallie and Mesurier is unpractical and capable of improvement. I have used their original technique[1] in the treatment of a number of extreme cases of hernia and have found that with a little practice the operation is eminently practical and satisfying. It is for use in the really difficult cases that their technique was devised, and I am sure that the substitution of short strips for long ones is not likely to be an improvement.

I am, Sir, yours faithfully,

London, March 7th, 1927. GEOFFREY KEYNES.

To the Editor of THE LANCET.

SIR,—In the very admirable Hunterian lecture on Recent Advances in the Surgery of Hernia delivered by Prof. E. M. Cowell and published in THE LANCET of March 5th, one sentence should, in my opinion, not be allowed to pass without comment. This sentence reads "fascia is a slipping tissue and is not easy to manipulate as described by Gallie and Le Mesurier."

I have used the method described by Gallie and Le Mesurier, since its publication in the *British Journal of Surgery*, for large ventral, incisional, and other types of recurrent hernia. It has also been used constantly in appropriate cases by my colleagues. The fascial sutures are quite easy to manipulate.

For medium-sized or small hernias the "improvements" on the method may be useful; but for very large and difficult hernias, it will be found that success will be uniform and complete in proportion to the exactitude with which the details given by Gallie and Le Mesurier are being followed.

I am, Sir, yours faithfully,

London, W., March 8th, 1927. T. P. DUNHILL.

FEMORAL THROMBOSIS FOLLOWING INFLUENZA.

To the Editor of THE LANCET.

SIR,—The following case has recently been under our care.

A man, aged 37, was seen on Jan. 25th, 1927, when he complained of chilliness, headache, pain in the loins and between the shoulder blades, and slight pain in the left chest. He had anorexia, his tongue was furred, his temperature was 102° F. and pulse 106. The bowels had been open and there were no physical signs. A diagnosis of influenza was made.

On Feb. 3rd, after his temperature had been normal for two days, he was allowed to rise. On the 7th he complained of severe pain in the left leg. This pain had commenced early the previous morning in the upper part of the calf and had gradually become worse. On examination the left leg was found to be considerably swollen and tense from Poupart's ligament to the foot, and showed a purplish-red discoloration. There was no difference in temperature between the two legs, and there was pulsation of the posterior tibial artery on both sides. The leg was tender over the upper part of the calf, and, to a lesser extent, over Scarpa's triangle. On the 8th the veins over the whole of the left side of the anterior abdominal wall were more prominent than those on the right side; and on the following day the left side of the abdomen was tender, slightly rigid and discoloured, suggesting a thrombosis of the lower part of the external iliac vein.

At 8.30 P.M. on the 10th, after the patient had had an enema in the morning with a good result, he stated that he had vomited everything since midday and was feeling very uncomfortable. On examination, the abdomen was uniformly distended and tympanitic. There was no rigidity or pain on pressure, and his tongue was furred and breath offensive; pulse 84, temperature 99°. A turpentine enema was given with no relief. The next day he was relieved of his vomiting by fluid diet and tincture of iodine, and was given eserine gr. 1/50 every six hours which did not relieve his distension until three days later, when a turpentine enema was administered with a good result.

The condition of his leg is showing a steady improvement. Possibly a reader of THE LANCET could suggest the cause of the tympanites?

We are, Sir, yours faithfully,

T. R. THOMSON.

Lamberhurst, Feb. 28th, 1927. C. G. E. PLUMSTEAD.

THE BLOOD-GROUPS OF "IDENTICAL TWINS."

To the Editor of THE LANCET.

SIR,—Mr. Douglas A. Mitchell in his letter which appears in THE LANCET for March 5th (p. 513) suggests the possibility of antagonistic "blood-grouping" of the fœtus being a cause of eclampsia. He will find some discussion of this question in an article by L. Hirszfeld entitled "Konstitutionsserologie" which appeared in *Die Naturwissenschaften*, Berlin, 1926, xiv., 17-25.

I am, Sir, yours faithfully,

CYRIL C. BARNARD,
Librarian, London School of Hygiene and Tropical Medicine.

Endsleigh-gardens, Euston-road, W.C., March 4th, 1927.

BLACKWATER FEVER IN ENGLAND.

To the Editor of THE LANCET.

SIR,—Dr. P. Manson-Bahr's article on Blackwater-Fever in England (THE LANCET, Feb. 5th p. 273) is of of very great interest but does not account for quite all the conditions met when blackwater fever is found in its own native habitat; of course much of the theory is impossible to controvert but there are almost epidemic forms of blackwater that do not harmonise with the subtertian causation. I recall a case of a subject who left a certain station near Duala because two of his fellow assistants had died of blackwater fever ten days after coming on board the mail boat; he went down with a sudden and violent attack of the fever. With regard to the blood picture, I have never seen the blood plasma in any case of malaria present the same appearance as it does in blackwater fever. In malarias the corpuscles are broken up and the blood is full of detritus, but in blackwater fever the corpuscles are not broken up, simply drained of hæmoglobin and coloured streaks of hæmatin are free in the plasma. There is not even a suggestion of the hæmatin in the malarial blood, so that it does not appear that the hæmoglobinuria is due to an overdose of hæmatin in the blood. In blackwater fever the

[1] Brit. Med. Jour., Jan. 29th, 1927.

hæmolysis appears to take place suddenly on the onset of the pyrexia. The number of malarial cases which are treated with quinine by mouth and by injection are enormous. The cases of blackwater fever are few, and when a patient has been treated with quinine after an attack of blackwater fever, and the malaria-infected corpuscles are seen breaking up, no recrudescence of the blackwater fever is found to occur. The blood picture in blackwater fever is typical and quite unlike any ordinary malaria blood, and when the blackwater fever disappears an ordinary malaria infected blood is still to be seen. Dr. Manson-Bahr's theory is most ingenious, and may account for some cases, but it is not quite sufficiently in accordance with observed facts to be wholly conclusive. Many of the symptoms and characteristics of blackwater fever are very allied to yellow fever and tempt one to imagine a connexion, but the study of Dr. Manson-Bahr's cases occurring in England eliminate that possibility.

Following is an account of blood film described with the film under observation at the time of writing:—

The red corpuscles are small and colourless. A few corpuscles are seen containing malarial parasites "en vacuole." The blood plasma shows streaks of bright-red colouring matter, looking like transuded contents of red corpuscles as if the hæmoglobin of the corpuscles had transferred itself to the plasma. The plasma contains a large quantity of high refracting granular matter in clumps and in fine granules. There is present, also, an enormous number of polynuclear cells, rather larger than red corpuscles. Nuclei deeply stained, nuclei slightly granular, and arranged either in fours or in pairs in each cell; when in fours they are equal in size and regularly placed: when in pairs, forming a double horseshoe, equal and opposite; some few cells with large, single and irregular shaped nuclei.

The whole question is most important because it raises the point of whether quinine should or should not be administered for severe malaria. Good results can be obtained from phenacetin in malaria and possibly with less danger. Again, we have heard much argument in regard to the prophylactic value of quinine. Personally, when in W. Africa I have always taken quinine religiously, but notwithstanding have had two severe attacks. We know all statistics appear to prove the prophylactic value of quinine, but it would be interesting to learn the unbiased views of modern West African medical officers upon this point. A discussion upon the subject in your columns might be very instructive.

During five years work on the coast of Africa, I had always a microscope at hand with me and examined every blood-infected case that I had to deal with. I never saw any other medical man using a microscope in daily practice, except in the hospitals of Free Town, Accra, Calabar, and Lagos. The medical officer in Africa ordinarily has not the time at his disposal for much microscope work.

I am, Sir, yours faithfully,

Southwick, Sussex, March 3rd, 1927. E. F. GREENE.

OPHTHALMIC BENEFIT.

To the Editor of THE LANCET.

SIR,—I have read the letters in your late issues with interest, and it seems to me that the question before us is of great importance, as the Ministry of Health and the approved societies are seeking to come to a satisfactory arrangement at the present moment, and we all want to see the problem clearly and dispassionately settled.

First of all "Every man to his own trade," as Mr. Lumsden points out. An *optician* is a maker of glasses and his business is commercial. An *oculist* is versed in the knowledge of the defects and diseases of the eyes and being a fully qualified medical man understands the relation of the part to the whole, for the eye is only a part of the body and suffers with it both temporarily and permanently. The workman needs and demands the same—viz., "the best"—as the rich man and the educated man, and greatly objects to be put off with the "second best"; by his insurance he can afford the best, especially since a large number of first-rate oculists have modified their fees to £1 1*s.* for his special benefit. He also demands an impartial and truthful opinion, and there should be no room for doubt. Opticians should not be allowed to test the eyes and supply the glasses as well; they should be removed from the faintest suspicion of self-interest. Likewise, no medical man should be allowed to send a patient to a member of his own firm, excepting in areas where no oculist exists.

The opticians are aiming at becoming a profession with diplomas and Government registration, and they instance the case of the dentist. But there is no parallel; the dentists have no body of men above them to compete with; they *are* specialists and their education is complete, prolonged, and expensive, and many are fully qualified in medicine and surgery as well as in their specialty.

Are the opticians willing to become medical men? If so, why not? Several have become so (of course, they become oculists). Are they willing to give up their advertising and shops and become a profession? Would it pay them? I am convinced that professions and commerce can never combine, as the standards are different. Why do opticians desire to be third-rate oculists? I imagine to be able to charge fees; but surely they do extremely well financially in selling their goods, and surely the burden, the danger, the responsibility of treating eyes will prove the small fee they charge to be inadequate.

The best approved societies seem well pleased with the present arrangements, which give complete satisfaction. The only question is, can they afford it? I think there is no doubt they can, but if not surely some insurance scheme can be devised which would easily finance the present moderate charge. Certain societies refuse the doctor's certificate and send their clients to the optician first, and if the optician says the case is beyond him he (the optician) refers the case to an oculist, and far more often to the hospital, and so a rich society can palm off its clients on charity (subscribed to in many cases by poor people); many are the cases that I have had sent to me at the hospitals where I work. Of course, the societies do not do this directly; it is done by the optician, but the result is to save a small fee and enable a rich society to become richer by using charity. This should be stopped.

In reference to Mr. Caddy's remarks on refraction, and to presbyopia generally, it is said that opticians do the work very well, also that mere presbyopia does not need skilled knowledge. I do not say that the best opticians cannot do refraction well—I think the best can; nevertheless, a "perfect opinion" can only be obtained from the "perfectly educated." Glaucoma can exist with good vision, at least for a time. It is stated that 95 per cent. of an oculist's income is derived from refraction cases; then it is obvious that if you subtract the 95 per cent. no oculist could live and ophthalmologists would become extinct. Why should the inferiorly educated and commercial body of men be rewarded disproportionately? Presbyopia may be the simplest work we do, but when a small correction is added to the presbyopic glass for a slight defect the improvement is great. Also, much judgment is needed as to the amount of the correction; no rule of thumb can apply, as the ciliary muscle varies in strength and health in different cases and the physician-oculist is a better judge than the optician.

No one can call our profession commercial when he knows that at the hospitals we treat tens of thousands of patients (many of whom can afford to pay fees) for nothing or little, year in and year out.

I wish to remain incognito but enclose my name and address.—I am, Sir, yours faithfully,

March 8th, 1927. F.R.C.S. OCULIST.

Obituary.

FRANCIS SHILLINGTON SCALES, M.D. CAMB.

MANY friends and many pupils will have seen with regret the announcement last week of the death at his residence in Cambridge of Dr. Shillington Scales, who had been in bad health for a considerable period.

Dr. Scales was the son of Mr. George J. Scales, and was born in London and educated privately until he went to Jesus College, Cambridge. At Cambridge he took honours in the Natural Science Tripos and later was Raymond Horton-Smith prizeman. He completed his medical education at Middlesex Hospital and became attracted by microscopy, which he took up as a special study. In 1905 he published a book on "Elementary Microscopy," which was followed in a few years by another treatise entitled "Practical Microscopy." Having proceeded to the M.D. degree in 1912, he became lecturer in microscopy at the Westminster Hospital Medical School, continuing, also, a close connexion with the Royal Microscopical Society, where he was a Vice-President after holding the post of curator and hon. secretary. He made frequent contributions on his subject and also upon radiology to scientific literature, and some seven years ago became University lecturer at Cambridge in Medical Radiology and Electrology. In connexion with this post he was appointed hon. physician in charge of the X ray and electrical department at Addenbrooke's, while he acted as examiner and secretary to the Board of Examiners for the special diploma given by the University in those subjects. As a teacher he was a great success. "He had trained himself" writes a recent pupil, "to a very exact use of language, and he expected the same accuracy from his students. He had developed a vivid word imagery to describe the various appearances or morbid conditions as seen in X ray photographs. Here his characteristic expressions of surprise when something unexpected presented itself will remain in the memories of those he taught, as well as the aptness of his Irish stories."

It is a serious loss to the medical profession and to the special studies of Cambridge University that Scales's valuable work in respect of the Diploma of Electrology and Radiology, both in the lecture rooms and in Addenbrooke's Hospital, should be so sadly closed.

LOUIS HEMINGTON PEGLER, M.D., C.M. EDIN., M.R.C.S. ENG.

AFTER living for some years in retirement Mr. L. H. Pegler died at his home at Exeter on Feb. 26th. The son of Daniel Pegler, he was born at Colchester in 1852 and was educated at the Colchester Royal Grammar School and at University College, London. For his medical training he went on to the University of Edinburgh and graduated in 1878, later taking the diploma of M.R.C.S. Eng. At the age of 28 Mr. Pegler entered upon ten years' service with the Clay Cross Company which had a hospital as part of its equipment. Soon after retiring from this appointment he began to specialise in aural surgery and for two years acted as registrar and pathologist to the Central London Throat, Nose and Ear Hospital in Gray's Inn-road. The work there was in turn given up when in 1896 he became surgeon to the Metropolitan Ear, Nose, and Throat Hospital, on whose active list he remained until 1921 when, as senior surgeon, he retired to the consulting staff. He was attached at one time and another to many smaller institutions, and from 1915–18 was in charge of the aural department of the Mile End Military Hospital. The anatomical aspects of his work particularly attracted him and he published a map scheme of the trigeminal nerve, besides a number of articles in medical journals. At the International Medical Congress held in London in 1913, Mr. Pegler was curator of the laryngological museum and a member of the Congress Council. He was also elected vice-president of the Section of Laryngology of the Royal Society of Medicine. Outside this work in his own line he was interested in biology and especially in botany, besides having a taste for archæology and music.

He married Maud Edith, daughter of Mr. F. W. Palmer, of Bedford.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

OPTICAL PRACTITIONERS' REGISTRATION BILL.

THE text of the Optical Practitioners' (Registration) Bill presented in the House of Commons by Mr. WEST RUSSELL has now been issued.

Clause 3 of the measure provides that any person over 21 shall be entitled to be registered and receive a certificate as a registered optical practitioner under the Act who (*a*) satisfies the Central Optical Board of Great Britain that he holds a recognised certificate, or other evidence of qualification, prescribed by regulations of the Board as sufficient, and that he is of good character; or (*b*) satisfies the Board that he has practised optometry in Great Britain during the five years next before the commencement of this Act and passes to the satisfaction of the Board's examiners a practical examination in optometry deemed by the Board sufficiently comprehensive to safeguard the public; together with evidence of good character; provided that the applicant applies for registration within six months after the commencement of the Act; or (*c*) having completed the prescribed training, has received from the Board's examiners a certificate of competency in the practice of optometry, and produces the same to the Board, and satisfies them that he is of good character. The possession of such certificate will entitle the holder to practise optometry and give certificates relating to visual acuity or visual defects which are to be recognised by any local or central authority, or Government Department, in any part of Great Britain.

Clause 4 provides for reciprocal arrangements between the Central Optical Board of Great Britain and any board of optical registration, or other competent authority, in any foreign state, or any of His Majesty's Dominions or Colonies, for the recognition of persons entitled to practise under the Act.

Under Clause 9 it is provided that any optical practitioner who applies to be registered under the Act shall pay an initial fee not exceeding £5 for registration, and thereafter an annual fee not exceeding £3 for renewal of certificate. The Board may charge for any certificate or other document issued, or in respect of any services performed by them, such fees as they may prescribe. No person who, having held a certificate under this Act, has ceased for a period of at least two years to hold such certificate will be entitled thereto unless he furnishes to the Board a satisfactory reason for having omitted or ceased to obtain such certificate, together with any proof of good character in the meantime. The Board (under Clause 10) can cause to be erased from the register (1) the names of dead persons; (2) any entry proved to have been fraudulently or incorrectly made; and (3) any member who is in default in payment of any prescribed fees.

The Board, subject to the provisions of the Act, is empowered by Clause 11 to make regulations regarding the removal of persons from the register, the prescribing of fees, the holding of examinations, the prescribing of training in optometry, the issue and cancellation of certificates, the practice of advertising by registered optical practitioners (provided that such regulations shall not prevent the publication of educational matter concerning vision) and so forth. Such regulations are to be laid before Parliament for a specified period, and if an Address is presented within 21 days praying that they be annulled, His Majesty in Council may annul them accordingly, but without prejudice to the validity of anything previously done thereunder. No person is to be suspended or removed from the Register without being given an opportunity of being heard by the Board, either personally, or with the assistance of counsel. Within three months of suspension or removal an aggrieved person may appeal to the High Court whose order shall be final and conclusive, and not subject to appeal to any other court.

Persons found guilty of offences under the Act are to be liable on summary conviction to a fine, not exceeding £50, with or without imprisonment, for a period not exceeding three months.

In a schedule to the Bill it is provided that the Central Optical Board of Great Britain shall consist of 12 members. On its first constitution the Board will be summoned by the Minister of Health and consist of one person appointed by the

General Medical Council, one by the Minister of Health, one by the Scottish Board of Health, one by the Board of Education, and eight others, all of whom shall be optical practitioners, appointed by the Minister of Health after consultation with such associations or organised bodies of optical practitioners as represent to the Minister that they desire to be consulted. Such Board will hold that office for two years from the commencement of the Act. The second and all subsequent Boards will be constituted in a similar manner to the first, except that the eight optical practitioners will be elected by members of the register from among persons whose names appear on the Register.

The Bill is intended to apply to Scotland, but not to Northern Ireland.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 2ND.

Scottish Approved Societies and Dental Treatment.

Mr. SCRYMGEOUR asked the Secretary of State for Scotland whether he was aware that many of the approved societies had been unable to meet their liability for dental treatment under the National Health Insurance Act owing to increased charges; whether such charges were negotiated with the dentists by the Scottish Board of Health without any consultation with any of the other interested parties; and whether, in view of the protests being made, he would reconsider the method of negotiation and suspend the present scale of charges.—Sir JOHN GILMOUR replied: Dental treatment is not a statutory benefit, and approved societies are under no obligation to provide it, but they may do so if they have surplus funds available for the purpose. It is not the case that the charges referred to were negotiated by the Scottish Board of Health. The scale was agreed by a Joint Dental Committee consisting of representatives of dentists and approved societies' interests. I have accordingly no power to take any action such as is suggested in the last part of the question.

Small-pox and Vaccination.

Mr. GROVES asked the Minister of Health what were the ages of the nine persons on whose death certificates the word vaccination, or vaccinia, appeared as the cause or one of the causes of death in 1925 and in 1926; and what were the ages of the cases in 1925 and 1926 in which such certification as the cause of death was subsequently withdrawn.—Mr. CHAMBERLAIN replied: The ages of the persons referred to in the first part of the question were, respectively, 5½ months; 8½ months: 3 months; 5 months; 5 months; 9 weeks; 17 days; 1 month; 6 months. The ages of the persons referred to in the second part were, respectively, 4 months; 4 months; 7 weeks; 1 month.

Mr. GROVES asked the Minister of Health whether, in the case in 1925 and the three cases in 1926 in which certification of vaccination or vaccinia, as the cause of death was subsequently withdrawn by the certifying practitioner, such withdrawal was the outcome of correspondence with a representative of Somerset House or an official of his department; and how long after vaccination death took place in these four cases.—Mr. CHAMBERLAIN replied: The answer to the first part of the questions is in the affirmative, but I should make it clear that the correspondence undertaken by the Registrar-General in these cases consisted solely of a routine enquiry addressed to the certifying practitioner as to whether he was of opinion that the cause of death was in any way associated with vaccination. This is in accordance with the practice which has been followed for many years of addressing inquiries to certifying practitioners respecting any indefinitely certified causes of death. As regards the second part of the question, the period between vaccination and death was seven days in two of the cases, and 9 and 17 days respectively in the other two.

Fatal Railway Accidents.

Mr. DAY asked the Minister of Transport the number of accidents that had resulted fatally for the 12 months ended to the last convenient date to passengers using or workmen employed on the railways of Great Britain.—COLONEL WILFRID ASHLEY replied: During the year ended 30th Sept. last, the number of fatal accidents to passengers using, or workmen employed on, the railways of Great Britain was 74 and 223 respectively.

Army Disability Cases.

Sir AYLMER HUNTER-WESTON asked the Secretary of State for War the number of soldiers discharged from the army during the year 1926 under the headings for wounds and for diseases respectively; and the number that were granted disablement pensions under each heading.—Sir L. WORTHINGTON-EVANS replied: The total number of disability cases (including those of men already discharged) dealt with by the Chelsea Commissioners during the year 1926 was 2546. 105 permanent pensions, and 764 temporary pensions were granted. No distinction is made between wounds and injury cases on the one hand and disease cases on the other, and I regret that separate statistics are not available.

THURSDAY, MARCH 3RD.

Ministry of Pensions Hospitals.

Mr. ALLAN PARKINSON asked the Minister of Pensions whether any hospitals were to be closed during the financial year 1927-28; and, if so, where they were situated.—Major TYRON replied: No arrangements have at present been made for the closure of any hospital during the next financial year. The hon. Member will, however, realise that the requirements of the Ministry in regard to hospital accommodation can only be determined from time to time by experience of the demand for this form of treatment.

Mr. THOMAS KENNEDY asked the Minister of Pensions what number of Ministry of Pensions hospitals he proposed to retain definitely to ensure that adequate facilities for in-patient treatment were available for so long as such might be necessary.—Major TRYON replied: It is not possible as yet to determine what will prove to be the definite, that is the ultimate, requirements of the Ministry in regard to hospital treatment, nor in what manner those requirements should best be met.

Mr. THOMAS KENNEDY asked the Minister of Pensions what was the total number of hospitals utilised for the treatment of war disabilities and the total bed accommodation provided as at Feb. 1st, 1927.—Major TRYON replied: On the date referred to there were 20 hospitals under the entire control of the Ministry with 4388 beds, and 17 other hospitals, not under the control of the Ministry, whose accommodation was wholly reserved for pensioners containing 2158 beds. In addition, 8152 beds were occupied by pensioners under treatment at the charge of the Ministry of Pensions in sanatoria and general or special civil hospitals.

Number of War Pensioners.

Mr. BECKETT asked the Minister of Pensions the number of pensioners on Feb. 1st, 1926 and 1927 respectively; and the number who had died during that period.—Major TRYON replied: On Dec. 31st, 1925 and 1926—the nearest dates to those stated in the question for which figures can be given—the number was 1,058,000 at the earlier date and 1,022,000 at the later date. The number of pensioners whose deaths were notified during the year 1926 was 19,550.

Small-pox in England and Wales.

Mr. DAY asked the Minister of Health the number of small-pox cases notified in Great Britain for the three months ended to the last convenient date.—Mr. CHAMBERLAIN replied: The number of cases of small-pox notified in England and Wales during the 13 weeks ended Feb. 19th was 5465, but this figure is subject to revision.

Draft Regulations under Lead Paint Act.

Mr. VIANT asked the Home Secretary the dates of the conferences held since Dec. 15th, 1926, with representatives of the painting and decorating industry, for the purpose of arriving at agreement in connexion with the circular recently issued for the regulation of the use of white lead in paint; and whether there was unanimity on the points raised in the circular.—Sir W. JOYNSON-HICKS replied: I am glad to have this opportunity of correcting a misunderstanding which has arisen in connexion with the explanatory letter issued with the draft Regulations under the Lead Paint Act. The letter stated that the terms of the Regulations had been discussed at a series of conferences with the industry at which a complete agreement was arrived at. The reference here was to certain conferences which had taken place in 1922 for the purpose of determining what Regulations could be made in the event of the Geneva Convention being ratified, but the statement has apparently been taken in some quarters to imply that conferences had been held subsequently to the passing of the Act, and that the draft Regulations were the outcome of a fresh agreement. This was not the case, and no such implication was intended or conveyed. The sole object of the circular was to remind the industry of the previous discussions and the agreement then reached, which applied, not only to external painting but also to internal painting during the interval before the prohibition was to take effect. Since the issue of the draft Regulations there has been a further meeting with representatives of the industry. This resulted, I am informed, in general agreement on the points discussed.

Danger from Steam Tractors.

Mr. WALTER BAKER asked the Home Secretary whether he had received representations from the Minister of Transport respecting the danger caused by the emission of smoke, steam, and sparks by steam tractors; and what action he had taken or proposed to take.—Sir W. JOYNSON-HICKS replied: Yes, Sir, and I propose to issue a memorandum to chief constables reminding them of their powers.

Sanitary Accommodation in L.C.C. Schools.

Mr. DALTON asked the President of the Board of Education whether he was aware that in new schools now being built by the London County Council the sanitary accommodation was below that of the Board's Building Regulations of 1914; and whether he would take steps to see that the standard hitherto enforced in respect of the building and remodelling of public elementary schools was preserved.—Lord EUSTACE PERCY replied: I am aware that, in the case of some girls' departments, the County Council have provided rather less sanitary accommodation than that previously required under the Building Regulations of 1914. Authorities are free to suggest a departure from the current practice where it appears to them desirable to do so; but no individual proposal is approved until the Board are satisfied that the accommodation of all kinds to be provided is adequate, having regard to the particular circumstances of the case.

Reaction Caused by Vaccination.

Mr. WINDSOR asked the Minister of Health whether he was aware that the medical officer of health for Sheffield had stated that, in spite of the utmost precaution on the part of the vaccinators, vaccination during the recent small-pox scare produced severe reaction, causing temporary illness and a good deal of swelling and pain; whether similar reactions had followed vaccination in other towns; and whether he would stop the issue of vaccine lymph which might cause illness of this kind.—Mr. CHAMBERLAIN replied: As regards the first two parts of the question, I would refer the hon. Member to answers already given. As regards the last part, I am advised that the results obtained from the use in Sheffield of the vaccine lymph issued by the Government Lymph Establishment have been uniformly successful, and among the many thousands of vaccinations performed with this lymph, no case has been reported to my Department in which a severe reaction has been attributed to the lymph. I have no control at present over proprietary lymphs, but regulations for the standardisation of all vaccine lymphs used in this country will come into force when the Therapeutic Substances Act, 1925, becomes operative.

Deaths from Influenza.

Mr. DAY asked the Minister of Health the number of deaths in Great Britain resulting from influenza for each of the three months ended to the last convenient date, giving the figures for London and each of the principal provincial towns.—Mr. CHAMBERLAIN replied: The figures asked for, so far as they are available for England and Wales, are contained in the tabular statement below.

Deaths from Influenza—England and Wales.
(Provisional Figures.)

Towns of over 200,000 population.	During the four weeks ended—			Total.
	Dec. 25th, 1926.	Jan. 22nd, 1927.	Feb. 19th, 1927.	
105 Great Towns.	249	1055	3292	4596
London	61	423	754	1238
Birmingham	9	20	42	71
Liverpool	9	16	39	64
Manchester	11	22	36	69
Sheffield	5	15	21	41
Leeds	8	10	23	41
Bristol	8	15	146	169
West Ham	3	12	60	75
Hull	1	5	27	33
Bradford	2	3	31	36
Newcastle-on-Tyne	3	5	7	15
Stoke-upon-Trent	1	2	19	22
Nottingham	1	1	91	93
Salford	1	6	16	23
Leicester	—	4	46	50
Portsmouth	3	5	24	32
Cardiff	2	22	52	76

Juvenile Delinquency Commission's Report.

Brigadier-General MAKINS asked the Home Secretary when the Report of the Commission on Juvenile Delinquency will be available.—Sir W. JOYNSON-HICKS replied: I understand that the Committee is likely to present its report towards the end of this month.

Diphtheria and Scarlet Fever.

Mr. DAY asked the Minister of Health the notifications of diphtheria and scarlet fever, and the deaths registered from these diseases, for each of the years 1911 to 1926, inclusive.—Mr. CHAMBERLAIN replied: The provisional notifications of diphtheria and scarlet fever in England and Wales for 1926 are as follows:—Diphtheria: Notifications 51,067, deaths 2923. Scarlet fever: Notifications 81,670, deaths 667. The corresponding figures for earlier years will be found in the Statistical Review of the Registrar-General.

MONDAY, MARCH 7TH.

Medical Services in the Army.

Sir L. WORTHINGTON-EVANS, Secretary of State for War, in moving that the House go into Committee of Supply on the Army Estimates, said that he was asking for a total sum of £41,465,000, which was £935,000 less than last year. Vote 3, relating to medical services, showed an increase of £60,000. This was in part due to improvements in pay and conditions of service of army doctors. For some years past the army medical service had not attracted sufficient young men to maintain the numbers required. Complaints had been made by the medical profession, vigorously supported by the British Medical Association, of the inadequacy of pay, of the frequency of moves, and of the length of foreign service tours. Many of these complaints seemed to have been well-founded, but though he took steps immediately it was some time before the new conditions could be put into force. The Cabinet appointed a Committee to inquire into the pay and conditions of service in the medical branches of the three fighting services, as it was impossible to deal with one without the others. Following the report of the Committee, the Royal Warrant of July of last year was issued, under which improved terms and conditions of service had been granted, and the British Medical Association was now recommending service in the Royal Army Medical Corps as a career for young qualified practitioners. He still wanted more candidates, however. In January last there was a larger entry, but there were still vacancies. He wished to draw the attention of newly qualified medical men to two features of the new conditions. Those who took up a house appointment could, under certain conditions, get an ante-date to their commissions, in other words, the service in an appointment of a hospital would count as service in the army. The other innovation was that, after seven years' service, an officer could retire with a gratuity of £1000. This might be attractive to young doctors who wanted to see a bit of the world before settling down in civil practice, and to whose capital an addition of £1000 might prove extremely useful. The army owed much to its medical officers, and he hoped that the reforms now operating would ensure a service as contented as it was efficient.

Mr. MACPHERSON said that praise was due to the Secretary for War because he had considered the position of the Royal Army Medical Corps. Those who followed the fate of that service during the war knew what magnificent work it did. The War Office were giving a little bounty to these men to come in, and they would come in willingly.

Major GLYN said that he noticed in the Estimates that the working expenses of seven hospitals, exclusive of salaries and maintenance, amounted to no less than £1,112,000. That seemed to him to be rather a large sum of money for the number of beds which were equipped. They all knew the need there was for economy and close inter-working between one service and the other. The Estimates Committee had gone into the matter and one of their recommendations was that there should be closer liaison between the services as regards hospital treatment. That had been carried out, and no doubt great economies had been effected, but at the same time it seemed to him that £1,112,000 exclusive of salaries was too high a figure.

Dr. VERNON DAVIES raised the question of pension awards to men who were discharged from the army suffering from consumption. He said that the question whether the disease was attributable to the conditions of service was one which it was impossible for the medical board at Chelsea really to decide. No one could say when a consumption germ might gain entrance into the human system. He understood that certain diseases were held as justifiable causes. For instance, if a man had malaria, dysentry, or contracted a bad cold after exposure, or got pneumonia and then developed consumption, it was possible that the medical board would hold that case to be attributable. And yet they would find that another man who had not had any of these diseases and who was working at the same time and under the same conditions would also develop consumption, and, therefore, it would be due to the conditions of service. There was some other factor in the man himself. If the War Office were perfectly logical they could take up the position that no case was due to the conditions of service. But they did not take up that position, and their attitude had caused a great deal of dissatisfaction in the country. There were three courses which the War Office might take in this matter. First of all they might take a definite stand and say that it was impossible to prove in any case that consumption was due to conditions of service, and that therefore they would wipe it out altogether. That might be a harsh, but it would be a very logical position. Secondly, the War Office might schedule a number of conditions or diseases which could be held to be producing causes of consumption. Thirdly—and this was the course which he would prefer—the War Office might institute a system of insurance under which every man in the service could be compulsorily insured

against the possibility of contracting consumption. He urged upon the Secretary of State for War that this was a question that required consideration.

Lieut.-Colonel FREMANTLE said that he wished to congratulate the Secretary of State on the action he proposed to take in regard to the Royal Army Medical Corps. This had been a long standing source of trouble since the late war. As a result of the recommendations of a committee which sat on this subject certain improvements were made in the pay of the service last summer, and it was hoped that that would lead to better recruiting for the army medical service. The deficiency which had to be made up was very great. Before the war the establishment of the Royal Army Medical Corps in officers was something like 1000; since the war it was cut down to 900, and there were under 800 officers on the strength last year. This year only 15 candidates had come forward to fill 25 vacancies, so that they were still in a backward position. The Secretary of State in order to meet the case was appealing for short service officers. After a few years when these men had become useful officers they would be entitled to return to civil life with a gratuity. They were increasing, therefore, all their troubles, because they were carrying on with an elderly service increasing always in seniority. That made for great dissatisfaction among the officers, because the older men had to serve over and over again. This was one of the most serious points, to his mind, in the army position at the present time. They were faced with the possibility of a terrible scandal which would go to the root of popular confidence in the army if the country had to engage in a war at the present time. Were they going to be disappointed, as would seem on the surface likely, in view of the poor response so far made to the appeal of the Secretary of State? He was a sufficient optimist to hope that they need not be despondent. At any rate it was too early to judge the results of the new terms which had been offered. But there was one thing that was perfectly certain; they would not get young medical men to take commissions in the fighting services unless those services took direct and vigorous measures to catch hold of them. That could be done now if the campaign was pushed home. He hoped that the best recruiting officers possible would be sent into their own hospitals and medical schools to try and attract young medical recruits into the service. The Secretary of State had mentioned that day that there had been a reduction in the medical services of the Territorial Force in respect of the casualty clearing stations. On the face of it this was a most serious proposal. Great difficulty was caused in the late war because they found it necessary to improvise casualty clearing stations. The first shock of battle meant a large number of casualties, and if the clearing stations did not know their work great difficulties arose. There was not very much required to gather together such stations, but it was just the trained personnel that was necessary. While the framework might be cut down he did hope that the Secretary of State would make arrangements whereby the personnel would continue to be trained so that they might form a nucleus which would be available on the outbreak of war.

Sir L. WORTHINGTON-EVANS, replying to the debate, said that the question raised by Dr. Vernon Davies was one of the most difficult medical questions that could be raised and not one with which that Committee could usefully deal. The hon. member said that it would be logical though harsh to refuse pension in all such cases, but he (Sir L. Worthington-Evans) was glad that they did not do that. It was better to be wrong in some cases than to take up a position of that kind. It was not the fault of the administration that they made mistakes, but it was due rather to the incomplete knowledge of the medical profession in regard to the causes of consumption. He could assure Colonel Fremantle that the War Office was doing its best to follow the course he had suggested. They intended to go round the hospitals and medical schools in order to induce young medical men to enter the army medical service.

Imported Dogs and Rabies.

Mr. DAY asked the Minister of Agriculture how many dogs had been imported in accordance with the Ministry of Agriculture's regulations during the six months ended to the last convenient date; and if any cases of rabies had been discovered during the time these animals were in quarantine.—Mr. GUINNESS replied: 388 dogs have been imported from abroad under licenses issued by the Ministry during the six months ended Feb. 28th last. One case of rabies was discovered among these dogs in a dog brought from India.

Ministry of Agriculture and Disinfectants.

Lieut.-Colonel FREMANTLE asked the Minister of Agriculture whether, seeing that the test for disinfectants which had now been adopted was considered unsuitable and unreliable by the Admiralty, the War Office, the Air Ministry, and other large purchasers of disinfectants, he would consider the adoption of a more reliable test.—Mr. GUINNESS replied: I am not aware that the test for disinfectants, which the Ministry has adopted for use under the Diseases of Animals Acts is in any sense unreliable. It was adopted after full consideration and scientific advice as being a test conducted under conditions which resemble, as closely as possible, the actual conditions under which the disinfectants prescribed by the Ministry are used in practice.

Colonel FREMANTLE asked if this had been agreed upon in consultation with other Government Departments which were equally concerned in getting a reliable test.—Mr. GUINNESS: The requirements of the other offices are very different from those of agriculture.

Colonel FREMANTLE asked if it would be possible to have this matter reconsidered from the point of view of science, as some equally high authorities are against this radical change.—Mr. GUINNESS: We have prescribed this test on scientific advice supported by the Ministry.

Colonel FREMANTLE asked the Minister of Agriculture if he was aware that brands of disinfectants, which had been approved by the Ministry, were being freely sold to agriculturists in inferior strengths and not labelled in accordance with the Diseases of Animals Disinfection Order, 1926, so that the public were unaware of the proper strength at which to use such agents, and the intention of the statute was plainly defeated; and if he would give the number of samples of disinfectants tested for his department which had been taken from supplies purchased in the open market and the numbers of manufacturers against whom proceedings had been taken for non-compliance with the order.—Mr. GUINNESS replied: The answer to the first part of the question is in the negative. Agriculturists and others required to use approved disinfectants under any Order issued in pursuance of the Diseases of Animals Acts should be careful to see that the preparation they are obtaining for that purpose is labelled clearly as prescribed in the Disinfection Order of 1926. The enforcement of the Orders requiring the use of disinfectants rests with the local authorities. I have no information as to the number of samples of disinfectants taken by those bodies, nor as to the number of prosecutions instituted. No prosecutions have been undertaken by the Ministry.

Colonel FREMANTLE asked if the right hon. gentleman would consider the possibility of his officers taking samples in the open market which could be relied upon instead of samples sent to him which were manifestly cooked-up for the purpose.—Mr. GUINNESS: In the ordinary way the local authorities are quite able to take samples from the open market. It would lead to unnecessary expense to duplicate samples.

School Medical Service.

Mr. HARRIS asked the President of the Board of Education what he considered was required to provide a local education authority with a complete medical service; how often a child should be inspected during the elementary school period, and what ailments should be included in the treatment scheme; and what was the standard aimed at by paragraph 6 of circular 1388 when it was laid down by the Board that the first aim of national policy should be the completion of the school medical service.—Lord EUSTACE PERCY replied: A complete school medical service for children in public elementary schools should provide for medical inspection, for following up cases of defect found in the course of inspection, and for medical treatment of defects. Local authorities are required to provide for the inspection of all children on admission to school, on attaining the age of eight, and on attaining the age of 12; provision should also be made for the inspection of special cases and the re-examination of children previously inspected. With regard to the last part of the question, it is not easy to define a rigid standard for a service comprising so many activities, but the hon. Member will find a discussion of the problems involved in chapter V. of the Annual Report of the Board's Chief Medical Officer, for the year 1924.

Disability Discharges in the Navy.

Lieut.-General Sir AYLMER HUNTER-WESTON asked the First Lord of the Admiralty whether he would inform the House the number of sailors discharged from the Navy during the year 1926 under the headings for wounds and for diseases, respectively; and the number that were granted disablement pensions under each heading.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Admiralty) replied: During 1926, 1632 naval ratings and marines were invalided for disease and 93 for injury or wounds. The number who were awarded pensions was 600 approximately. I regret that statistics are not available distinguishing between pensions for injury or wounds and for diseases.

TUESDAY, MARCH 8TH.

Vivisection Experiments on Animals.

Lieut.-Col. FREMANTLE asked the Home Secretary whether he had received from his inspectors, under the Cruelty to Animals Acts, any reports during the last five years

indicating either demonstrations before classes of students or painful experiments of a prolonged and agonising nature on dogs or other animals; and, if so, what action had been taken, and with what result.—Capt. HACKING replied: No, Sir, no such experiments would be permitted and there is no evidence whatever that any have taken place. In the case of experiments before students, they are all required to be performed under anæsthetics and the animal must be killed before it recovers consciousness. As regards other experiments, all holders of licences who have certificates either dispensing with the requirement to use anæsthetics, or permitting the animals to recover from the preliminary operation under anæsthetics, are subject, in respect of every such experiment, to a special condition known as the pain condition. The terms of this condition are printed in the report which is laid by my right hon. friend each year before the House and are such as to render "experiments of a prolonged and agonising nature" impossible. For many years past the inspectors under the Act have not found any instance of an infringement of this condition; if an inspector did observe any animal to be suffering considerable pain he would at once order it to be killed.

Lieut.-Col. FREMANTLE: Is my hon. and gallant friend aware that specific statements, which he declares to be untrue are being publicly circulated by the National Canine Defence League, and are said to have resulted in a very large number of subscriptions? Can the hon. and gallant gentleman do anything to prevent such misleading statements?

Capt. HACKING: No, Sir, I know that many things are said by many organisations that are not true (loud cheers) and I hope that my answer will get as wide a circulation

Mr. BROMLEY: Can the Under Secretary for Home Affairs say whether some of the inspectors who are put to watch these proceedings have not themselves been vivisectors and are, therefore, in sympathy with them?

Capt. HACKING: No, Sir, that is a very unfair thing to say (cheers). The inspectors carry out their duties very creditably to themselves, to this House, and to the State

Mr. BROMLEY asked if there had not been such inspectors?

The SPEAKER: The hon. Member ought not to make such suggestions.

INFECTIOUS DISEASES IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 26TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 438 (last week 346); scarlet fever, 1238; diphtheria, 1039; enteric fever, 35; pneumonia, 3828 (last week 3523); puerperal fever, 41; puerperal pyrexia, 120; cerebro-spinal fever, 16; acute poliomyelitis, 10; acute polio-encephalitis, 1; encephalitis lethargica, 38; dysentery, 11; and ophthalmia neonatorum, 141. No case of cholera, plague or typhus fever was notified during the week.

No further cases of small-pox were reported from Cheshire, Lancashire, Lincolnshire, or Glamorganshire. Otherwise the disease was limited to the same counties as last week—namely, Derbyshire, 13; Durham, 216; Northumberland, 26; Nottinghamshire, 3; Yorkshire, 145; and Monmouthshire, 35.

The Welsh outbreak, which this last figure records, was described in THE LANCET last week, p. 506. We are informed that it has now assumed formidable dimensions, roughly 200 cases having been reported since the first case was discovered on Feb. 18th. While the greatest proportion of the cases are in the Eastern valleys of Monmouthshire, which includes the towns of Abersychan and Blaenavon, cases have been detected over a wide area, including Argoed in the Sirhowy Valley and Aberbargoed in the Rhymney Valley which divides Monmouthshire from Glamorgan. A case has also occurred, apparently by casual infection, at Aberdare which is in the middle of the mining valleys of Glamorgan. Three cases of small-pox in Newport have been definitely confirmed. Chicken-pox has been made notifiable by several authorities in South Wales, and the Welsh Board of Health are urging all authorities to adopt this precaution. The Cardiff City Council are speeding up the building of their new small-pox hospital, and a proposal to use the disused prison at Usk for the isolation of cases of small-pox is causing a certain amount of controversy in Monmouthshire.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 4 (1) from enteric fever, 59 (1) from measles, 8 (1) from scarlet fever, 137 (26) from whooping-cough, 41 (11) from diphtheria, 31 (3) from diarrhœa and enteritis under two years, and 1023 (81) from influenza. The figures in parenthesis are those for London itself. The influenzal deaths for the last seven weeks have thus been 326, 470, 725, 818, 759, 990, and 1023, whilst 898 is the number notified for the week ending March 5th, the figure for London being 69.

THE TRAINING OF NURSES FOR THE TROPICS.

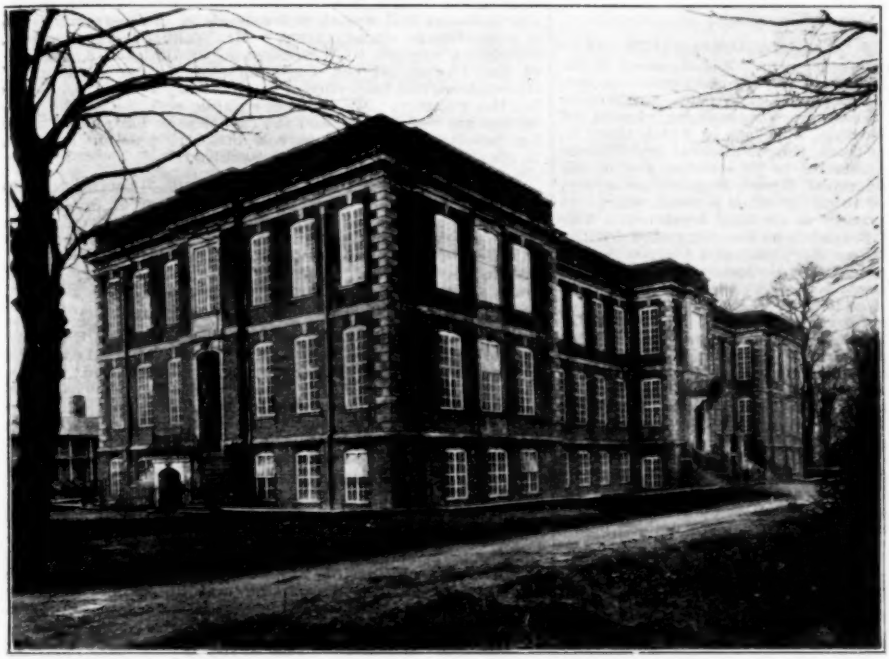
AT a lecture at the College of Nursing on March 8th Dr. Philip Manson-Bahr said that a nurse equipped with elementary knowledge of the causation and prevention of tropical disease was an indispensable adjunct to efficient medical work in the tropics. Tropical nursing was distinct from ordinary nursing and henceforward would have to be a distinct branch of the profession. Nurses in the tropics were often isolated and separated for days at a time, and had to undertake responsibilities such as came to few nurses in this country. She must know, inter alia, how to guard against insect-borne and water-borne disease, how to do invalid cookery, how to keep water cool, how to manage native servants, how to use quinine, or, if necessary, inject it, and how to prepare saline solutions, and other necessary drugs; should occasion arise she might be expected to help administer chloroform or do even more dramatic things. Microscopic examination of blood and excreta had a far wider range of utility in the diagnosis and treatment of tropical diseases than in other branches of medicine, and the tropical nurse would find life more interesting if she had an elementary knowledge of how these things were done. At the Hospital for Tropical Diseases, under the ægis of the Seamen's Hospital Society, a course of instruction was given in the elements of tropical nursing. The subjects of the course included personal hygiene in the tropics, clothing, exercise, food, alcohol, baths, cooking, preservation of food, utilisation of tropical fruits and food, substitutes for milk, avoidance of prickly heat, protection from insect bites and a whole host of other subjects. The general lectures dealt with the principal tropical diseases. At the end of the course, the nurses were examined in these subjects and a certificate of proficiency was awarded by the Seamen's Hospital Society. Staff nurses undertaking nursing abroad could now be taken on the staff of the Hospital for Tropical Diseases for six months and in doing so were free to attend the course of lectures and pass the examination. The course was open also for nurses outside the hospital..

Referring to a leading article on Qualifying Examinations for Nurses published in THE LANCET, (March 5th, p. 499) Dr. Manson-Bahr said that a very high standard of technical knowledge, not always, it might be said, possessed even by medical men, was required by the General Nursing Council. A detailed knowledge of anatomy and physiology was not expected of nurses for life in the tropics, nor were they asked to imbibe details of the life-history of disease-bearing parasites which were demanded of doctors qualifying for the higher examinations. It was intended however, that they should know the importance of these parasites and the means by which they were spread. The knowledge was of a practical nature.

THE LATE DR. LUMSDEN BELL.—Dr. James Lumsden Bell, probably the oldest medical practitioner in the East Riding, died at his home at Driffield on March 1st, aged 88 years. Dr. Bell had lived in the town for 60 years. He went first to Driffield as a tutor, and after studying medicine in Edinburgh, where he graduated M.B. and C.M. in 1880, returned to Driffield and took over a large practice. He leaves a widow, two sons, and a daughter.

GIFTS TO THE LONDON HOSPITAL.—Mr. Bernhard Baron who recently gave £10,000 to the London Hospital towards the cost of building a new pathological department, has now given a further sum of £25,000 to endow it. It has been found that the new department will cost more than was expected, the lowest estimate being £15,000, and the Rockefeller Foundation has offered the additional £5000 without conditions. The Governors have received another generous gift—the freehold site on which the greater part of the hospital stands, from Mr. L. Abrahams. Mr. Abrahams bought the site from the City of London for £526 12*s*.

SIR WILLIAM DUNN SCHOOL OF PATHOLOGY, OXFORD.



This new Institute will be opened to-day, Friday, March 11th, by Lord Cave, Lord Chancellor of England and Chancellor of the University of Oxford.

(From a photograph by James Soame, 105, St. Aldates, Oxford.)

A NOTE ON THE ACTION OF A LEAD-SELENIUM COLLOID ON CANCER.*

BY A. T. TODD, M.B. EDIN., M.R.C.P. LOND.,
HON. ASSISTANT PHYSICIAN, BRISTOL ROYAL INFIRMARY; DEMONSTRATOR OF PATHOLOGY, BRISTOL UNIVERSITY.

THE article published by Prof. Blair Bell on the action of colloidal lead on cancer (THE LANCET, 1925, ii, 793) suggested independent research. It was considered that the addition of selenium might increase the regressive action of lead, and that the analgesic properties of this element might lessen the pain of cancer and diminish the pain of lead intoxication.

A lead-selenium colloid was prepared and its toxicity and dosage worked out on animals. Then it was used in the treatment of advanced, completely inoperable carcinomas and sarcomas. It was not expected that these cases could be cured; it was hoped that the compound would cause regression and ease pain. A small group of diverse cases was treated, for one observer could not hope to follow results of a new remedy except on a small group. The results appear to confirm the working hypothesis, for regression has occurred in about 50 per cent. of the cases. The analgesic action was striking in the one case in which pain was marked; the absence of colic of any severity, even in cases showing severe blood changes, also encourages the hope that the analgesic action is of value.

The regressive action of lead on cancer was postulated from the resemblance of cancer to chorion (Blair Bell). The more malignant the neoplasm the greater is the resemblance to chorion and the greater should be the hope of causing regression. The preparation under discussion has marked abortive properties on animals, and with suitable dosage this action is the only obvious one. The series is too small for a definite decision, but the preparation has given better results in the more rapidly growing neoplasms.

The action on neoplasms having been proved, it is suggested the physician and surgeon can combine in reducing the mortality of cancer by (1) injection after complete operative removal, to kill any possible remaining cell; (2) reduction of the number of inoperable cases—some of these are due to recent rapid growth from a slowly growing core; the rapid growth should be vulnerable, the core may be removed; (3) the destruction of the remainder after the mass has been removed by the knife.

Brief Summary of the Cases Treated.

(1) Squamous carcinoma of œsophagus. Visible carcinoma disappeared, but a recurrence appeared in another place shortly afterwards.

(2) Large ulcerated squamous carcinoma of cervix. The growth has disappeared and the cervix appears healthy. No symptoms three months later.

(3) Sarcoma of mediastinum. Transient improvement after each treatment, considerable relief of pain. Sarcoma found to be much necrosed post mortem.

(4) Large squamous carcinoma of tongue; rapid growth slowed and some relief of pain. Growth persists.

(5) Carcinoma uteri, gave up the treatment at an early stage.

(6) Squamous carcinoma tongue, large growth with extensive glandular involvement. Large ulcer became smaller, no other effect.

(7) Carcinoma of cervix, compressing ureters and extending down vagina. Mass replaced by dense fibrous tissue, no obvious carcinoma. Condition good, but for vesico-vaginal fistula.

(8) Large fungating spheroidal cell carcinoma breast, firmly fixed to ribs. Mass shrank considerably, became small and freely movable. Excision of breast. Small scirrhus found.

(9) Squamous carcinoma lip. Growth appears to be practically stationary. No other result.

(10) Papillary ovarian carcinoma with many large metastases all over the peritoneum. Intestinal obstruction occurred; at operation only one small nodule of carcinoma remained visible.

(11) Carcinoma of tonsil, large submaxillary glands. Growth perhaps less and glands softer.

(12) Recurrence of carcinoma of cervix after Wertheim. Treatment has just started. Mass is much smaller and requires searching for to be found.

* An abstract of a lecture on the preliminary results of this treatment given to the Bristol Medico-Chirurgical Society on March 9th, 1927.

Medical News.

DANGEROUS DRUGS REGULATIONS, 1926.—The Home Secretary has given notice that, in pursuance of the Dangerous Drugs Regulations, 1926, he has appointed two Medical Tribunals—one for England and Wales, and one for Scotland—to which, as occasion arises, may be referred for examination and consideration, any case in which there is, in his opinion, reason to think that a medical practitioner may be supplying, administering or prescribing any of the drugs to which the Dangerous Drugs Regulations apply, either to or for himself or to or for other persons, otherwise than as required for purposes of medical treatment. The appointment of these Tribunals was recommended by the Departmental Committee on Morphine and Heroin Addiction, presided over by Sir Humphry Rolleston, which reported in January, 1926 (see paras. 65 to 75 of the Report). The Tribunals are constituted as follows:—*England and Wales:* Sir Humphry Rolleston, Bart. (chairman), nominated by the General Medical Council; Sir William Hale-White, nominated by the Royal College of Physicians of London; and Dr. John Wardle Bone, nominated by the British Medical Association; with Mr. E. W. Hansell, Recorder of Maidstone, as legal assessor. *Scotland:* Sir Robert Philip (chairman), nominated by the Royal College of Physicians of Edinburgh; Dr. Ashley Watson Mackintosh, nominated by the General Medical Council; and Prof. Thomas Kirkpatrick Monro, nominated by the British Medical Association; with Mr. John Cowan, K.C., as legal assessor. Substitute members have also been appointed for each Tribunal to act in the event of the original members being unable to do so.

ST. BARTHOLOMEW'S HOSPITAL: THE SURGICAL WARDS.—A luncheon was given at the Mansion House last week by the Lord Mayor, Sir Rowland Blades, to further an appeal for £200,000 on behalf of St. Bartholomew's Hospital. The ward blocks, said Lord Stanmore, the treasurer, are more than 200 years old and need "most drastic reconstruction. Some of the operation theatres were erected as lean-to's more than 20 years ago; they are not connected with the wards, and surgical cases have to be taken across the square in all weathers." It is therefore proposed to put up a five-storey building to contain ten new surgical wards of 25 beds each, which would be connected with an operation theatre, and the usual accessories on each floor. In the basement there would be an electro-therapeutic department, and on the roof new laboratories. Sir Berkeley Moynihan said that on a recent visit to the hospital, he had "found some things that were almost a disgrace—the operation departments were not up to the standard of a first-class hospital in the provinces."

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Mr. Zachary Cope will lecture for the Fellowship on Common Mistakes in the Diagnosis and Treatment of Acute Abscess, on Thursday, March 17th, at 5 P.M., at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square. On Wednesday, March 16th, at 4 P.M., Mr. R. C. Davenport will give a special demonstration at the Central London Ophthalmic Hospital, Judd-street, and on Friday, March 18th, Mr. Aleck Bourne will give a special demonstration in gynæcology at the Samaritan Hospital, Marylebone-road. The lecture and demonstrations are free to members of the medical profession. From March 14th to 25th the Chelsea Hospital for Women will hold a special course in gynæcology, occupying either the mornings or afternoons only and consisting of lectures, demonstrations, and operations (fee £5 5s.). The Royal National Orthopædic Hospital will hold a two weeks' course from March 21st. There will be morning and afternoon sessions, including operations, lecture demonstrations and instruction in the out-patient department, and a special visit will be made to the Brockley Hill County Hospital on Saturday, April 2nd (fee £2 2s.). Also beginning on March 21st the London Temperance Hospital will give a two-week's course primarily for the benefit of the general practitioner. Instruction will be given from 4.30 to 6 P.M. (fee £1 1s.). The Queen's Hospital for Children starts a course on March 28th, lasting for two weeks. A full all-day programme has been arranged and a special feature is made of showing cases, rather than of lectures; lunch and tea are provided (fee £3 3s.). From March 28th, for two weeks, the Royal Eye Hospital will give a series of demonstrations during the afternoons on the diagnosis and treatment of the eye (fee £1 1s.). The Fellowship arranges for practical courses in anæsthetics and obstetrics, and also makes arrangements for clinical assistantships in gynæcology. Copies of all syllabuses and of the *Post-Graduate Medical Journal* are obtainable from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

UNIVERSITY OF LONDON: Election to the Senate.—At the election on May 10th of a medical member of Convocation to the Senate, Mr. W. McAdam Eccles, surgeon to St. Bartholomew's Hospital, is a candidate. His experience as a councillor is already great.—Mr. Walter George Spencer, consulting surgeon to Westminster Hospital and a member of the Council of the University of London Graduates' Association, has been chosen by that body as their candidate for the vacancy. Mr. Spencer's public services to the profession are well known, and the fact that he has retired from his hospital appointments will make it possible for him to give time to the duties of a Senator.

LISTER CENTENARY CELEBRATIONS.—Owing to the limited capacity of the House of the Royal Society of Medicine, those wishing to attend the social evening on April 4th, when Sir StClair Thomson will give an address entitled "The Centenary of Lister: Recollections by one of his House Surgeons," should apply to the Secretary of the Society for admission cards, whether they are Fellows, Associates, or Members of the Society or not.

INTERNATIONAL LISTS OF THE CAUSES OF DEATH.—At the request of the Health Organisation of the League of Nations, British, American, French, Italian, and Danish experts will meet on March 14th to study the proposals of a number of Governments, and of an American Committee on the possibility of revising the international list of the causes of deaths. These experts will also consider unification of the existing methods of registering infant mortality.

RADCLIFFE INFIRMARY.—The Governors of the Radcliffe Infirmary at Oxford are considering the urgent need of extensions. The hospital requires another surgical ward for women, a women's accident ward, a second operating theatre, and some isolation beds. These enlargements would entail the provision of a first-class nurses' home; the accommodation for the nursing and domestic staffs are insufficient and unsatisfactory. It is hoped to make an early start with these extensions.

BRITISH MEDICAL ASSOCIATION: SCHOLARSHIPS AND GRANTS IN AID OF SCIENTIFIC RESEARCH.—The Council of the B.M.A. will receive applications as follows:—

Research Scholarships, a scholarship, known as the Ernest Hart Memorial Scholarship, of the annual value of not more than £200, and three other research scholarships each of the annual value of not more than £150, for research in any subject, including State Medicine, relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on Oct. 1st, 1927. A scholar may be reappointed for not more than two additional terms, and may hold a junior appointment at a university, medical school or hospital, provided the duties do not interfere with his work as a scholar.

Grants.—The Council will also receive applications for grants for the assistance of research in the same directions, preference being given to applicants who propose as subjects for investigation problems directly related to practical medicine.

The conditions of the awards of the scholarships and grants will be supplied on application to the Medical Secretary of the Association, Tavistock-square, London, W.C. 1, and applications for the year 1927-28 must be made not later than Saturday, June 4th, 1927, on the prescribed form, with the names of three references; the form will be supplied by the Medical Secretary.

SCOTTISH CRIPPLED CHILDREN.—After a year's inquiry an Edinburgh Committee has just reported that there is a "clamant need" for a central hospital for the treatment of crippled children in South-Eastern Scotland, and a public meeting in the capital has accepted their recommendations. It is proposed that the institution should be on the outskirts of Edinburgh, that major clinics should be formed at important centres of population, and with minor clinics linked to them, that there should be coöperation between the new special hospital and the existing ones, and that children should be admitted up to 16. The Scottish Board of Health will give grants up to that age. There would be a minimum of 75 beds, which with site and equipment, would cost £1000 per bed.

RESIGNATION OF A HOSPITAL STAFF.—The Committee of Management of the Dorset County Hospital at Dorchester, proposed to alter one of the rules to read as follows: "Patients may retain the services of their own medical attendants, but in a case requiring an operation they shall obtain the coöperation of a member of the medical staff at such operation." The whole of the honorary medical and surgical staff of the hospital immediately resigned, on the ground that all matters of professional concern should be referred to them for their opinion before any action is taken. A few days later the rule was withdrawn for further consideration, and the staff cancelled their resignations.

Dr. W. Essex Wynter will deliver an Emeritus lecture in the Large Lecture Theatre of Middlesex Hospital Medical School, on Friday, March 18th, at 3 P.M. The subject will be The Study of Local Diseases and Remedies.

BRITISH HOSPITALS ASSOCIATION.—The annual meeting and conference of this Association has been fixed to take place at Norwich on Thursday and Friday, June 23rd and 24th.

IRISH MEDICAL SCHOOLS AND GRADUATES' ASSOCIATION.—The annual dinner of this Association will be held on Thursday, March 17th, at 7.30 P.M., Sir W. I. de C. Wheeler, the president, in the chair. Vice-Admiral Sir Frederick Field will be the principal guest.

MIDDLESEX HOSPITAL.—Prince Arthur of Connaught, chairman of the hospital, has received £1000 from Lieut.-Colonel Beddington in response to Mr. J. A. Berner's offer to give that sum towards the new block of paying wards for the hospital, if nine others would do the same.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—Hospitals situated within 11 miles of St. Paul's which may wish to participate in grants for 1927 made by the Fund must apply before March 31st to the hon. secretaries at 7, Walbrook, E.C. 4. Applications will also be considered from convalescent homes which are within the above area or which, although situated outside it, take a large proportion of patients from London.

SOUTH DEVON AND EAST CORNWALL HOSPITAL.—The pressure upon this Plymouth hospital, which serves a district extending from Clovelly on the north to Land's End on the south, has become so severe, that it is proposed to extend it by providing 70 additional beds, a number of paying beds, and a new out-patient department. It will then be the largest voluntary hospital in the West of England.

THE NEW SOUTHEND HOSPITAL.—So many agencies are at work raising money for the erection of the proposed new General Hospital at Southend-on-Sea, that the committee of the new hospital fund is requiring that the organisers of all efforts in aid shall obtain official approval of their plans, and that all printed matter shall bear the official badge of the fund, together with an indication of the proportion of the receipts which are to go to the hospital.

VACCINATIONS AT SOUTHPORT.—The Chairman of the Health Committee stated at a meeting of the Town Council that the first case of small-pox appeared on Jan. 8th, and that altogether there had been 51 cases, and only four of them had been vaccinated, and those were vaccinated in childhood. The last case recorded was on Feb. 18th, and only 14 cases remained in the hospital. Over 15,000 people have been vaccinated since the outbreak.

MEDICAL SOCIETY OF LONDON.—The 154th anniversary dinner of the Medical Society of London was held at the Grand Hotel, London, on Monday, March 7th, the President of the Society, Sir Humphry Rolleston, in the chair. The toast of the Society was proposed briefly by Sir John Rose Bradford, who laid stress on its seniority and on the individuality which it had always preserved. In a witty reply the Chairman pointed to the strong surgical bias which had recently marked the official lectures, and announced that the sessions this year would be closed by an address from the great American surgeon, Harvey Cushing. The vitality of the Society, he considered, made it a young though an old institution, and in proof of his words he referred to the increasing membership and the good attendance at the meetings. The toast of the Visitors was proposed by Dr. Walter Carr, who said that three lines were open to a speaker in his position—that of general reflection, that of categorising all the guests present and mentioning their merits—an invidious and lengthy process, and that of referring to one guest in the more spacious manner. Lt.-Col. J. R. Lord, President of the Royal Medico-Psychological Association, had been selected as the victim. Colonel Lord, in his reply, suggested that such was the growing influence of psychology in medicine that his special branch, so far from being the Cinderella, might be held as the superior of many sections of their science, and he pointed out that the famous Quaker physician, who founded the Medical Society of London—Lettsom—was a great psychiatrist; for, realising 150 years ago the effect upon mental development which the system of slavery must entail, he had been led to emancipate all the slaves on his family property in the West Indies, although at the time that he did so he possessed no other private pecuniary resources. The health of the President was proposed by Mr. J. E. H. Roberts, who ran rapidly through Sir Humphry Rolleston's varied posts and performances, mentioning at the end of the imposing list the fact that he had played for his hospital in a winning cup team. Suitable acknowledgments of the toast by the secretaries of the Society, Dr. F. G. Chandler and Mr. V. Z. Cope, closed a pleasant evening.

UNIVERSITY OF LIVERPOOL.—Lord Derby, Chancellor of the University, has agreed to add during the next seven years an annual donation of £1000 to the £500 per annum he is already contributing to the University funds.

UNIVERSITY OF ABERDEEN.—On Wednesday, March 23rd, the University of Aberdeen will confer the honorary degree of LL.D. upon Sir William Milligan, of Manchester, and Sir Frederick Gowland Hopkins, Professor of Biochemistry at Cambridge.

ROYAL AERONAUTICAL SOCIETY.—A lecture, entitled Man and the Machine will be delivered by Group Capt. M. Flack, at 6.30 P.M., on Thursday, March 10th, at the Royal Society of Arts, 18, John-street, Adelphi, London, W.C.

BIOCHEMICAL SOCIETY.—The annual general meeting will be held on Friday, March 18th, at 4.30 P.M., in the Department of Physiology and Biochemistry, University College, Gower-street, W.C.

METROPOLITAN ASYLUMS BOARD.—A three months course on clinical practice and hospital administration, for the Diploma of Public Health, will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, N. 15, by Dr. F. H. Thomson, the medical superintendent, on Mondays and Wednesdays at 4.45 P.M. and alternate Saturdays at 11 A.M., beginning on Monday, April 11th. Application should be made to the Clerk to the Board, at Victoria Embankment, London, E.C. 4.

CHELSEA CLINICAL SOCIETY.—The next meeting of this Society will be held at The Rembrandt Hotel, Thurloe Place, London, S.W. 7, on Tuesday, March 15th, at 8.30 P.M. preceded by dinner at 7.30 P.M. Dr. Russell Andrews, Dr. F. J. McCann, and Sir Bruce Bruce-Porter will take part in a discussion on Professional Regrets.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY. On March 3rd the President (Dr. Gustave Monod) and Madame Monod received members and guests at a conversazione in the rooms of the Medical Society of London. Those present were drawn from ten different countries and included the Minister for Latvia and representatives of the French and Italian Embassies and of the Czech Legation. A lecture was read by Mr. Yates for Mr. Lewis Abbott of Hastings on the History of Silica, which was illustrated by specimens shown on the epidiascope. An address was given by Prof. Desgrez who brought greetings to the Society from the Institute of Hydrology of the Faculty of Medicine of Paris and gave a short description of the teaching of hydrology in France and the work of research and standardisation carried on by the Institute. After acknowledging Prof. Desgrez's tribute to the Society the President called upon Mr. W. A. Appleton (Secretary of the General Federation of Trade Unions) to make a statement on the attitude of the Unions towards rheumatism in industry. Mr. Appleton is a member of the Society's British committee on rheumatism which is seeking to establish a clinic in London in pursuance of the scheme suggested by the Ministry of Health. The evening ended with a violin recital by Madame J. van Breemen.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 14th.—5 P.M., WAR. Paper: Surg.-Comm. C. H. Dawe, R.N.: Diet and Disease in the Navy.

TUESDAY.—5.30 P.M., GENERAL MEETING OF FELLOWS. 8.30 P.M., PATHOLOGY. Annual General Meeting. Papers: Prof. H. T. Deelman: The Part Played by Injury and Repair in the Development of Cancer, and Some Remarks on the Growing of Experimental Cancers. Dr. Oliver Heath: The Defence Process in the Body in Typhoid Fever. Prof. McIntosh: Some Experiments on Immunity with the Rous Sarcoma.

WEDNESDAY.—6 P.M., COMPARATIVE MEDICINE. Paper: Prof. Mollgaard (of Copenhagen): Chemotherapy: with Special Reference to Heavy Metals. 5 P.M., HISTORY OF MEDICINE. Papers: Sir D'Arcy Power: The Writings of the Elizabethan Surgeons as Literature. Prof. Morpurgo (Padua): English Physicians at the University of Padua in the Collegio Veneto Artista (1617-1771) (communicated by Dr. Singer). Dr. C. Singer: An Example of the Egyptian God Bes Exhibiting Symptoms of Spina Bifida (postponed from Feb. 16th). Dr. Herbert Spencer: Wolveridge's Speculum Matricis (1671) with notes on two MS. copies in the Society's library.

THURSDAY—5 P.M., DERMATOLOGY. (Cases and Demonstration at 4 P.M.). Demonstration: Dr. A. C. Roxburgh: The Detection of Ringworm Hairs on the Scalp by

Ultra-violet Light. Cases will be shown. Paper: Prof. W. E. Dixon (Cambridge): Thallium.

FRIDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY. Specimens: Mr. L. C. Rivett: Carcinoma of the Cervix complicating Pregnancy. Mr. Gordon Luker: Fibromyoma of Uterus; Rupture of the Capsule with Protrusion of Part of the Tumour with Secondary Necrosis. Paper: Mr. Aleck Bourne and Dr. J. H. Burn: The Dosage and Action of Pituitary Extract and of the Ergot Alkaloids on the Uterus in Labour, with a Note on the Action of Adrenalin. 8.30 P.M. ELECTRO-THERAPEUTICS. Discussion of Cholecystography. *Opener*: Dr. N. S. Finzi.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 14th.—8.30 P.M., Demonstration on Lipiodol Injections by Dr. Jacques Forestier.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, March 17th.—8.15 P.M., A Laboratory Meeting will be held at the Royal Army Medical College. The following, amongst others, will give Demonstrations: Dr. S. Adler, Dr. A. Balfour, Maj. J. S. K. Boyd, Maj. C. R. Chadwick, and Mr. C. MacHattie (shown by Dr. Wenyon), Mr. C. A. Hoare, Dr. Saiki, Dr. E. C. Smith, Dr. H. H. Scott, Dr. A. C. Stevenson, Dr. C. M. Wenyon, Prof. Warrington Yorke, and Dr. A. R. D. Adams.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 15th.—5 P.M., Prof. F. R. Fraser: Cardiac Dyspnœa. (Second Goulstonian Lecture.)

THURSDAY.—5 P.M., Prof. F. R. Fraser: (Last Goulstonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, March 14th, to SATURDAY, March 19th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, Cavendish-square, W., at 5 P.M., on Thurs. Mr. Zachary Cope: Common Mistakes in the Diagnosis and Treatment of Acute Abscess. Open to all members of the medical profession without fee.—SAMARITAN HOSPITAL, Marylebone-road, N.W. Special demonstration in Gynæcology on Fri., at 2 P.M., by Mr. Bourne. Open to all members of the medical profession.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Wed., 4 P.M. Special demonstration in Ophthalmology by Mr. Davenport. Free to members of the medical profession. CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special course in Gynæcology.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, March 14th.—10 A.M., Mr. MacDonald: Genito-Urinary Operations. 2 P.M., Mr. Addison: Surgical Wards. 2 P.M., Dr. Ironside: Medical Out-Patients.

TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-Patients.

WEDNESDAY.—10 A.M., Dr. Owen: Medical Diseases of Children. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Stewart: Neurological Department. 12 noon, Mr. Simmonds. Demonstration of Fractures. 4 P.M., Mr. Donald Armour: Head Injuries.

FRIDAY.—11 A.M., Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Mr. Vlasto: Operations on Throat, Nose, and Ear.

Daily.—10 A.M. to 5 P.M., Operations, Medical, Surgical, Special, Out-patient Departments (Saturdays, 10 A.M. to 1 P.M.).

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 14th.—10 A.M., Surgical Clinic. 2 P.M., Medical Cases in the Wards. 2.30 P.M. to 5 P.M., Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.

WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

On WEDNESDAY, March 16th, and FRIDAY, March 18th, at 2.30 P.M., there will be special demonstrations of Dermatological and Surgical Cases by Dr. W. Jenkins Oliver and Mr. E. Gillespie respectively.

Also on FRIDAY, March 18th, at 4.30 P.M., Dr. L. R. Yealland will demonstrate on Cases of Nerve Diseases.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.

FRIDAY, March 18th.—4.15 P.M., Dr. Charles Singer: The History of Yellow Fever.

ROYAL NORTHERN HOSPITAL POST-GRADUATE COURSE.

TUESDAY, March 15th.—3.15 P.M., Dr. H. E. Shaw: Demonstration of Pathological Specimens.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 17th.—4 P.M., Mr. Barrington-Ward: Acute Appendicitis.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, March 18th.—4 P.M., Mr. Harold Kisch: Acute Mastoiditis. Its Diagnosis and Treatment.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY.

WEDNESDAY, March 16th.—5.30 P.M., Mr. A. T. Pitts: Management of Orthodontic Cases.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 15th.—5 P.M., Dr. Wilfred Fox: Nævi.

THURSDAY.—5 P.M., Dr. K. Bailey: Pathology Demonstration.

ST. MARGARET'S HOSPITAL FOR WOMEN, Acomb-street, Whitworth Park, Manchester.

WEDNESDAY, March 16th.—4.15 P.M., Mr. A. C. Magian: The Cure of Sterility in Women.

ST. MARY'S HOSPITALS, MANCHESTER. POST-GRADUATE LECTURE.

FRIDAY, March 18th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. W. Fletcher Shaw: Forceps.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURE.

TUESDAY, March 15th.—4.15 P.M., Mr. J. P. Buckley: Meckel's Diverticulum.

FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 18th.—3.30 P.M. (at the Royal Hospital), Mr. Garrick Wilson: Surgical Cases.

PEOPLE'S LEAGUE OF HEALTH. (Sims Woodhead Health Lectures.)

MONDAY, March 14th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Prof. B. Collingwood: Excretory Systems.

Appointments.

Certifying Surgeons under the Factory and Workshop Acts: CLAYTON, C. J. W., L.R.C.P.Lond., M.R.C.S. (St. Columb.: Cornwall); MILLER, T., M.B., Ch.B. Glasg. (Dumbarton); LLOYD, E. R. (Stewarton, Ayr).

Vacancies.

For further information refer to the advertisement columns.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. and Asst. H.P. Each at rate of £100.

Bristol, Cossham Memorial Hospital, Kingswood.—*Res.* M.O. £150.

Cambridge, Addenbrooke's Hospital.—H.S. and H.P. Each at rate of £130.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Senior and Junior H.S. At rate of £100 and £50 respectively.

Charing Cross Hospital, W.C.—Asst. Obstet. P.

Charing Cross Hospital, Institute of Pathology.—Pathologist. £500.

Chester Royal Infirmary.—Hon. Asst. Anæsthetist.

City of London Hospital, Victoria Park, E.—Radiographer.

Delhi, India, Lady Hardinge Medical College.—Professor of Physiology. Rs.750 monthly.

Dorchester, Dorset County Hospital. Second Hon. P.

Dreadnought Hospital, Greenwich.—H.P. and H.S.'s. Each at rate of £110.

Durham County Hospital.—Jun. H.S. At rate of £120.

Elizabeth Garrett Anderson Hospital, Euston-road.—Phys. in charge of Children's Dept.

Essex, Administrative County of.—Asst. County M.O.H. £700.

Glasgow University.—Muirhead Chair of Obstetrics and Gynæcology.

Halifax Royal Infirmary.—Third H.S. At rate of £100.

Hereford County and City Mental Hospital.—Second Asst. M.O. £350.

Hospital for Consumption and Diseases of Chest, Brompton, S.W.—Asst. Surg. to Throat, Nose, and Ear Dept.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. M.O. for X Ray, &c.

Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W.—Res. H.S. At rate of £75. Also Asst. P.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. and Asst. Cas. O. Each at rate of £56

Hindley Urban District Council.—M.O.H., &c. £850.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. and One H.P. Each at rate of £100.

King's Lynn, West Norfolk Hospital.—Jun. H.S. £100.

Leicester Royal Infirmary.—Two Surgical Dressers. 10*s.* 6*d.* weekly.

Liverpool, Royal Southern Hospital.—Hon. S., Hon. Dermatologist, and Hon. Ophth. S.

London, Female Lock Hospital, 283, Harrow-road, W.—Surg. Reg. £100.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

Malayan Medical Service.—M.O.'s $500 per mensem.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.

Manchester, Babies' Hospital, Burnage Lane, Levenshulme.—Res. M.O. At rate of £125.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Manchester, Salford Royal Hospital.—Two H.S.'s. Each at rate of £125.
Manchester, Victoria Memorial Jewish Hospital.—Hon. S. Also Res.M.O. £250.
Metropolitan Asylums Board, Infectious Hospitals Service.—Asst. M.O. £500.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. £125.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.
Northampton County Borough.—Asst. M.O.H. £600.
Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100
Preston and County of Lancaster Royal Infirmary.—H.S. £150.
Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s. and H.P. At rate of £120. Also Jun. H.S. and Jun. H.P. At rate of £90.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.P. At rate of £100.
Royal Free Hospital, Gray's Inn-road, W.C. (Children's Dept.)—First Asst. for Infant Welfare, &c.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.
Royal Northern Hospital, Holloway, N.—H.P. Also Obstet. H.S. Each at rate of £70.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surg. Reg. and Hon. Orthopædic Surg.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100. Also Hon. Surg. to Out-patients.
Sheffield, Winter-street, Hospital for Tuberculosis.—Res. M.O. £350.
Shoreditch, Metropolitan Borough Municipal Dental Hospital, 164, Kingsland-road.—Anæsthetist at rate of £1 14*s.* per session.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. and three H.S.'s. Each at rate of £50.
Southampton County Borough, Isolation Hospital.—Res. M.O. £360.
Surrey County Council.—Asst. M.O. in Public Health Dept. £600.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg. £100.
Westminster Hospital, Broad Sanctuary, Westminster, S.W.—Second Dental Surg.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Leiston, Suffolk.

Births, Marriages, and Deaths.

BIRTHS.

DOUTHWAITE.—On Feb. 27th, at "Carlingford," Worthing, Sussex, the wife of Dr. A. H. Douthwaite, of a daughter.
JACKSON.—On Feb. 27th, at Knowle, Fareham, Hants, the wife of J. L. Jackson, M.B., of a son.
NASH.—On Feb. 28th, at Winn-road, Southampton, the wife of Major E. L. F. Nash, R.A.M.C., of a son.
SMITH.—On Feb. 28th, at Sherborne House, Gloucester, the wife of Dr. E. F. Smith, of the Chestnuts, Stroud, Gloucestershire, of a daughter.
TWORT.—On March 1st, at The Wilderness, Camberley, the wife of Dr. F. W. Twort, The Brown Institution, of a daughter.

MARRIAGES.

CAHILL—BERESFORD.—On March 1st, at the Church of St. Thomas of Canterbury, Woodford, Henry Bernard Martin Cahill, L.D.S. R.C.S. (Eng.), to Doris Maud, elder daughter of Walter A. Beresford, of St. Mary's Croft, Wanstead, Essex.
HARGREAVES—MERRYWEATHER.—On Feb. 23rd, at Mandeville, Jamaica, George McNeill Hargreaves, M.D., to Margaret, daughter of the late Ernest Merryweather.

DEATHS.

DANCY.—On Feb. 28th, at Duke's-avenue, Chiswick, Horace Michael Dancy, M.R.C.S., L.R.C.P., late of Ramsgate, Kent, aged 74.
GREENE.—On March 5th, at Kingsnorth-gardens, Folkestone, John Alan Campbell Greene, M.R.C.S., L.R.C.P., M.C., late of Woodsley-road, Leeds.
PEGLER.—On Feb. 26th, at Snayle's Tower, Exeter, Louis Hemmington Pegler, M.D., M.R.C.S., L.R.C.P., late of Harley-street, London, W.
PRESTON.—On March 1st, at Wyndham House, Ryde, I. of W., Lionel Litchfield Preston, M.B., B.S., aged 62.
SCALES.—On Feb. 28th, at Redcourt, Adams-road, Cambridge, Francis Shillington Scales, M.D.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

CREMATION IN GREAT BRITAIN.—A slow but steady increase of cremation in the whole of Great Britain is shown by comparison of figures for 1922 and 1926,* the totals being 2009 and 2877 respectively.

Notes, Comments, and Abstracts.

RHEUMATIC INFECTION OF CHILDHOOD.*

BY CAREY F. COOMBS, M.D., F.R.C.P. LOND.,
PHYSICIAN WITH CHARGE OF OUT-PATIENTS, BRISTOL GENERAL HOSPITAL.

I.

THE series of lectures to which this discourse belongs serves to remind us of the labours of a man who spent his life and strength in organising the fight against disease. Of Sir Edwin Chadwick and his fellow-workers may we most truly say, "Other men laboured, and we have entered into their labours." From them we have inherited, not only comparative freedom from zymotic disease, but also the apparatus for combating that which remains. I trust that I may be able to show you that in three respects at least the infection to which our attention is to be directed this afternoon must be fought with the weapons that Chadwick did so much to create: housing control, care for the health of the elementary school-child, and coördination of the machinery already in being.

Definition.

The label "rheumatic" covers a rather wider area when it is used by the public than it does in the hands of the medical profession. It is to the narrower sense that I shall limit it; I shall follow the definition of the rheumatic diseases assumed by the Ministry of Health in its recent Report,[1] with one important difference. The inquiry on which that report was based was restricted to the insured population, so that children were excluded. This necessarily excluded from the inquiry a majority of patients suffering from what is best called "the rheumatic infection." It has been well said, I think by Dr. F. J. Poynton, that this disease assumes its typical form in childhood, attacking adults less often and in a form in which the articular aspects are atypically emphasised.

The Manifestations of Infection.

The fact is that the rheumatic fever of adults, fortunately less common than it was, offered so dramatic a picture of suffering that it quite threw into the shade the insidious yet far more dangerous cardiac lesions of childhood. It is mainly to the London school of physicians that we owe our present and more accurate view, that which sets the cardiac lesions in the centre of the stage and treats the other manifestations as of less importance. The cardiac inflammation is one of several manifestations of the activity of this infection, the four chief of which are carditis, polyarthritis, chorea, and subcutaneous nodes. All these reactions are similar in their essentials, if we allow for the local colour prescribed by the nature of the tissue infected.

These changes are most easily studied in the heart, but reach their extreme expression in the subcutaneous node. If we watch their evolution in one of the seams of connective tissue that traverse the cardiac muscle, we shall detect the first change in some small blood-vessel. Its lining cells swell and multiply, it becomes the centre of a brisk inflammation, and after being sealed by clotting is more or less wholly destroyed. The mobile defensive cells that are called from a distance seem to disappear from the picture, leaving the inflammatory field in possession of cells, for the most part local in origin. As these again recede, a characteristic picture is revealed; a background of fibrin, embedded in which lie large cells with many nuclei, and cells destined to become fibrous tissue. This, in turn, gives way to a permanent but inconspicuous scar. If the muscle cells of the heart wall be examined, it will be found that they have not escaped. Changes similar in type to but less in degree than those of diphtheria can be seen. The cardiac muscle has been attacked by a poison which entered through its own proper blood-vessels and spread thence to all parts. If the dose of poison is concentrated enough it may kill outright. More often the patient survives but with permanent disabilities; for an inflammatory reaction of a kind similar to that seen in the interstices of the heart muscle has been set up in the serous tissues that clothe that muscle and assist it in its work. The valves that lie within the heart and are essential to its value as a pump are thickened and deformed, and at least fail to help, often actually hindering, the work that the heart has to do. Often, also, the pericardial sac by which the heart is enveloped is partially or wholly ruined. The two layers which should slip over each other

* Lectures on the Causes and Prevention of Rheumatism, delivered under the Chadwick Trust. The first lecture (of which this is the first half) was given on March 3rd, 1927.
[1] Ministry of Health Report, No. 23, 1924.

so smoothly as to nullify the friction of the beating heart against its surroundings are welded together into a fibrous mass, and thus once more a permanent disability is laid on the heart.

Nor is this all. The infection which has attacked the heart is seldom content with one of these raids. Usually it comes again and again, so often in many cases that its inroads assume the character of a prolonged occupation. It is true that as age advances these raids tend to become less frequent. Yet the combination of permanent mechanical disability and recurrent drenchings with poison is very deadly. Every year claims its victims, especially the first 10 or 15 years from the date of the primary infection. There is, moreover, a steadily increasing degree of disablement, which ultimately becomes complete in those who escape death.

The other manifestations are less deadly, but one of them, an inflammation of the brain and its coverings, is responsible in the aggregate for a great deal of interference with the education of the growing child. It is exhibited in the form of chorea, or St. Vitus's dance, which may keep the child out of school for weeks or months, and recur from time to time. Joint pains seldom afflict the rheumatic child severely, and their chief significance is to act as a warning of the probable coexistence of a cardiac inflammation.

Of the subcutaneous node I must say a word or two. In the severest cases of rheumatic infection in childhood these nodes are to be found in the parts where but little fat intervenes between skin and bone; for example, over the elbows and knees. They are not painful and seldom tender, and are likely to be overlooked unless they are deliberately searched for. Their genesis is exactly the same as that of the inflammatory spots in the cardiac muscle that I have already described, although they are on a larger scale; a blood-vessel becomes inflamed and closed, and around it a mass of new cells is formed, which evolves into a small scar in the course of a few weeks. Although these nodes are only seen in the severest cases of rheumatic infection, when they do occur they are more characteristic of that infection than any other of its manifestations, for there is no other infection that produces their like.

Disablement and Recovery.

This, then, is the disease of which we are hearing so much—an inflammation of the heart which tends to become chronic and to inflict lasting disability on those who survive its earliest onslaughts. From a study of statistics several facts emerge: first, that if recovery takes place at all it must necessarily be in the early stage; second, that the disease claims a large proportion of its victims also in that earlier stage; third, that of those who, though uncured, survive that stage few reach the age of 50; finally, that those who do survive are seriously disabled.

One thing is encouraging. The results of a follow-up of over 600 cases which was carried out with the aid of a grant from the Medical Research Council, showed a surprising number of apparent recoveries, even among children whose hearts had undoubtedly been damaged. I feel sure that we shall get far better results when we have learnt to treat this disease as patiently and thoroughly as we treat, for instance, tuberculosis of bones and joints. Our views on the treatment of chronic and persistent infection are moving in the direction first pointed by the open-air treatment of tuberculosis. To the application of rest, carefully controlled and if necessary prolonged, under conditions affording a maximum of sunlight and fresh air and good food, has in recent years been added a tendency to alternate rest with occupation as a therapeutic agent; and these principles have found a wide application in the treatment of rheumatic heart disease in America. In this country there is a growing belief in the country hospital-school for the treatment of crippling disease in childhood; and in the benefits to be derived from such institutions as these the cardiorheumatic child is destined to share.

But here we are chiefly concerned with means for the prevention of rheumatic heart disease. First, we must realise that the disease is already decreasing. This is the experience of most general hospitals, and, moreover, an examination of the mortality records for Bristol for the years 1876–1913 showed quite clearly that there was a fall in the annual death-rate of this disease. There are three other facts that emerged from this enquiry which will, I believe, interest you. First, it was seen that though the death-rate from this disease was decreasing, it was decreasing less rapidly than the general death-rate did during the same period. Second, the years which saw large semi-rural areas brought into the city and therefore into these records, were followed by an acceleration in the fall of the rheumatic heart disease death-rate. The inference is that if a city's population is diluted by the addition of country districts, the percentage of that population attacked by rheumatic heart disease will be smaller. Third, by a comparison of these mortality records with records of hospital cases in which the diagnosis had been checked by post-mortem examination, I came to the conclusion that Bristol, a city of a quarter of a million people on an average of the period of inquiry, lost between 70 and 80 lives per annum from this disease.

Taking the population o fGreat Britain at forty million, we may deduce the annual loss from this disease as about 12,000. This would include deaths from such forms of valvular disease as are generally admitted to be rheumatic in origin—namely, mitral stenosis and aortic regurgitation in persons under 30. A rough estimate of the mass of disablement inflicted on our nation by this form of heart disease is to be found by allowing an average of five years' disablement to each case. This brings the number of persons permanently disabled by it up to 60,000 in any given year.

Predisposing Factors.

Some of the conditions predisposing to this disease are so generally admitted, that it will be enough to state them. Of my cases of rheumatic heart disease two-thirds arose between the ages of 5 and 15. The disease falls a little more often on girls than on boys, in somewhere about the proportion of three to two. A hereditary predisposition appears to be traceable in about 50 per cent. Probably it exists potentially even where it does not reveal itself actually. The disease is relatively rare in tropical countries, falling with particular intensity on this country and Northern Europe. Its incidence is heaviest in the winter months, as was seen in a curve plotted from the Bristol figures, using only those in which the disease appeared to have been acute and therefore of recent origin.

These are causal circumstances over which we have no control. Now we must turn to three or four factors which are of more practical importance because they might be susceptible of modification. At the same time they must be received with a little caution, as we cannot claim that any one of them is established beyond controversy. In the first place, I have already mentioned urbanisation, but let me at once disarm criticism by saying that we are at present trying to organise, in the West of England, an inquiry into the incidence of the disease in urban versus rural communities. By this means we hope to secure valuable evidence, and the question may be decisively settled one way or the other. Second, there is the poverty factor. There are various views on this, but I am sure I am expressing the sense of the majority in laying stress on the contrast exemplified in my own experience, which shows that 50 per cent. of the cases of heart disease admitted to hospital are rheumatic, as against only 25 per cent. of those seen in private practice. The evidence collected by Dr. Vincent Coates and Dr. R. E. Thomas[1] from their inquiry in Bath went to show that the incidence of the disease was heaviest in the better-class industrial suburbs, and apparently less among the very poor. Be that as it may, it is quite certainly a rare disease among the well-to-do.

This brings us to another point, that of housing. My inquiries in Bristol gave no support to the view that certain houses were so heavily infected as to injure one inmate after another. In only eleven houses had more than one death from rheumatic heart disease occurred, and in none of these had there been more than two deaths. But another Bristol investigation, carried out recently by Dr. R. A. Askins and Dr. J. Morrison, into the condition of the home of a number of elementary school children with rheumatic heart disease, showed, conclusively to my mind, that dampness in houses had something to do with the origins of rheumatic infection. This inquiry was most carefully conducted. Dr. Morrison himself visited the houses and made a thorough inspection. In Bath Dr. Coates and Dr. Thomas noted a coincidence between the distribution of the disease, and houses built on alluvial soil. These facts, together with others collected by Dr. Reginald Miller in Paddington and Dr. A. P. Thomson in Birmingham, have persuaded me that there is a connexion between damp in houses and rheumatic infection, although my own research into mortality records had previously led me to think otherwise.

(To be concluded.)

AN ARGENTINE MEDICAL JOURNAL.

UNDER the name of *Cordoba Medica* Dr. Antonio Novarro issues the first number of a periodical which is intended to give a monthly survey of the whole field of medicine whether in the Argentine or abroad. It opens with articles on the syndrome of coronary occlusion, on the presternal muscles and on the plastic surgery of the nose. The beginning is promising, if modest, and the journal should prove stimulating to medical work in Cordoba.

[1] THE LANCET, 1925, ii., 326.

A NEW METHOD OF COMBATING OLD AGE.

Prof. E. Steinach has published in the January number of the *Medical Journal and Record* details of a new minor operation which can be carried out in patients who have already been subjected to bilateral vasotomy. The results of vaso-ligature are admittedly temporary and once the operation has been performed it is impossible again to have recourse to this method of stimulating the activity of the interstitial cells.

The new operation may be described as "albugineatomy." Through a small opening in the scrotum the testicle is exposed, and with the help of an assistant kept in its position. After selecting a place in the tunica albuginea with very few blood-vessels, an incision of from 2–3 cm. is made. The edges of the incision separate, and spontaneously a small piece of testicular substance protrudes. This piece, about the size of the kernel of a date or a small olive, is smoothly cut off with scissors, and after ligaturing any vessel that bleeds, the albuginea is sutured together with a fine needle and cat-gut. Finally the tunica of the testicle and the scrotal wound is closed.

Steinach explains the rationale of the operation as follows. The tightly stretched albuginea keeps the whole convoluted mass of the seminiferous tubules under pressure. Like wires in a bundle, the tubules are pressed closely together leaving very small interstices for the interstitial cells. Diminution of this pressure by permitting a separation of the tubules encourages the growth of the interstitial cells in the interstices. In addition, the local trauma inflicted on the seminiferous tubules by the removal of the protruding mass of testicular tissue leads to a degeneration of the tubules in the region of the operation, and to a proliferation of interstitial cells. Both these factors cause an increase of interstitial cells and reactivation of the internal secretion of the testes, and this in turn leads to a stimulation of the whole endocrine system. According to Steinach, the biological consequences of albugineatomy in senile animals are similar to those obtained by vaso-ligature. So far this method has only been carried out on a few human subjects, but it may, be regarded as a possible repetition therapy for those cases in which bilateral vaso-ligature has already produced positive results.

USEFUL WELFARE WORK.

ARRANGEMENTS are being made by the Post Office authorities, through the British Spas Federation, whereby postmen and certain other members of the Post Office staffs will be able to obtain a course of spa treatment at any of the British spas at special inclusive terms. Owing to the nature of their work postmen are, perhaps, especially subject to rheumatism, and in future any who have been medically recommended for spa treatment will no longer be prevented from obtaining that benefit on account of the cost. The spa authorities have also offered to give every assistance in their power in helping to find suitable accommodation. In view of the attention now being given to the question of making spa treatment available for insured persons suffering from rheumatic diseases, it is interesting that a great Government Department, probably the largest employer of labour in the country, should anticipate the National Insurance Scheme. This useful piece of welfare work will be appreciated by those whom it is designed to help, and the taxpayer, at no cost to himself, stands to benefit by the more speedy return of the postman to duty and his increased efficiency.

MIXTURES OF BUTTER AND MARGARINE.

THE improvement of the methods available for distinction between butter, oleo margarine, and vegetable margarine is a matter which interests not only the analyst but the medical man responsible for the dietaries of organised communities, whether armies, schools or hospitals. It is important for the latter to know whether his charges are being fed on butter which is easily digestible and fairly rich in vitamin A, on beef olein, which is less satisfactory in these respects, or on mixtures largely composed of coconut and palm kernel oils, which are fats deficient in vitamin content, and not easily digestible by many people. The use of hydrogenated oils is also to be watched for. Reichert, Polenske, and Kirschner have respectively furnished standardised means of measuring the acids volatile in steam, the insoluble acids volatile in steam, and the volatile acids which yield soluble silver salts. If the assumption that definite values for each of these data could be assigned to the fats in question, we should be still in the position of having only three parameters for four unknowns, and further assumptions would be needed before a taste for simultaneous equations could be indulged. Actually there is no difficulty in determining whether or not butter is substantially pure, or in distinguishing between oleo and nut-margarine. It is when it is desired to ascertain the composition of mixtures that difficulties arise. The current number of the *Analyst* contains papers by G. D. Elsdon and P. Smith, and C. H. Manley on this subject. Elsdon and Smith, who base their work on the Polenske and Reichert values alone, quote Mr. H. Droop Richmond's estimate of the scope of their results. He says: "The most that can be expected from your results are first, it is possible to distinguish coconut oil and palm kernel oil; second, that when the two exist in the same mixture and the percentage of coconut oil is well under 50 per cent., an approximate idea of the relative proportions of the two oils can be deduced within about 15 or 20 per cent. either way." The determination of butter fat in margarine is probably more trustworthy. Mr. Manley introduces a new value which is a measure of that (greater) portion of the soluble fatty acids which goes into aqueous solution when the saponified butter is acidified with sulphuric acid. The process and a modified Kirschner process based on it appears to be useful for sorting butters and margarines, which is all that is claimed for them. It is probable that the most useful development of the examination of these materials from the physiological point of view would be the application of some of the colorimetric methods of estimation of the growth-promoting vitamin. The trustworthiness of some of these when compared with experiments on animals appears to be well established. The economic aspect of a knowledge of the actual constituents of a mixture of fats will, however, continue to furnish incentive for improvements in analytical methods.

CUTANEOUS ADSORPTION.

A PAPER by Dr. Antonio Fernandez in the *Semana Medica* for Jan. 13th gives the result of some experimental work on the phenomena of cutaneous adsorption—i.e., the union, whatever be its nature, between epidemal cells and a substance applied to their surface, such union not being chemical, nor solution in the strict sense, nor intracellular.

The experiments show that the application of phenol, resorcin, and β-naphthol, in solution or as an ointment, results in adsorption; the scales of the skin treated with them are found to give up the substances used in varying proportions, the quantity being greater with an ointment than with a solution. Even after 24 hours, distinct traces of phenol were found in the scales removed from the areas treated. The method used was simply to apply the substance with proper precautions to the interdigital spaces, when, after they had been left for 24 hours, some scales were removed and placed in tubes with water or with appropriate reagents. In all cases the results were positive.

The facts are interesting so far as they go, but they are too scanty to admit of any general deduction. The research might well be extended to other substances, and also to showing how long the substance adsorbed remains in the cells of the epidermis before it is either absorbed or resecreted by the skin. Variation in adsorption in different persons, and different pathological conditions could also be studied and might give valuable results.

THE DETECTION OF BILE-SALTS IN URINE.

THE classical test devised by Matthew Hay for the detection of bile-salts in the urine has been investigated by Surgeon Lieut.-Commander W. I. Gerrard,[1] who finds that it remains by far the best and easiest way of demonstrating their presence. The test depends on the capacity of urine to sustain flowers of sulphur scattered over its surface. The sulphur will float on the surface of normal urine but will sink to the bottom if the surface-tension has been reduced by bile-salts in solution. To secure the best results, says Commander Gerrard, a standard technique must be used. The sulphur should be shaken from a pepper-pot held by a clamp 2·5 c.cm. above the surface of the urine, which should be contained in a rectangular cell. This cell should be illuminated by a source of light shaded from the observer's eyes and shining into the urine at right angles to the direction in which he is looking. The sulphur sinks at once, he says, when the bile-salts are in a strength up to 1 in 10,000. If the vessel is gently shaken the presence of bile-salts can be detected after two minutes in a dilution of up to 1 in 40,000; by waiting ten minutes falling of the sulphur may be seen where salts are present in dilutions up to 1 in 120,000. Using this technique, Commander Gerrard found that in a seris of cases of salvarsan jaundice there was a greater disturbance in the elimination of bile-salts than of bile and pigments. In many cases there was true dissociation in that, although both bile-salts and pigments were present in the blood, only the former appeared in the urine. In so-called catarrhal jaundice this dissociation was seldom detected, and he believes that the occurrence of bile-salts in the urine without bile-pigment is a sign of definite hepatic damage.

[1] Journal of the Royal Naval Medical Service, July, 1926.

PHYSIQUE OF THE JEWS.

IN a recent lecture to the West End Jewish Literary Society, Dr. Lyle Cameron described the Jews as, on the whole, a healthy and sturdy people. Of the factors which had preserved them health had been one of the most important, and Jewish racial characteristics were evidently dominant or they would have been superseded long ago by those of the nations with which they had from time to time sojourned, and with whom there must have been admixtures of blood.

Jews, he said, possessed a high degree of natural immunity to bacterial disease. Ordinary septic infections troubled them but little. They had a high resistance to malaria, and were the best suited of all white races to live in malarial districts.

It had long been held that the Jewish race contributed more cases of insanity than any other. Studies by A. Pilez in Vienna, and C. F. Beadles in London, supported this view. In 1880 Spitzka, in America, came to the conclusion that the various forms of insanity occurred in nearly the same proportions in the Anglo-Saxon, Teutonic, and Hebrew races. In Germany in 1909 Sichel, whose deduction was based on the Frankfort Hospital for the Insane, found relatively more Jewish inmates than the corresponding percentage of the Jewish population of Frankfort. This, however, only held for certain groups of mental disorders. The other types revealed a smaller percentage of Jews than non-Jews. Amaurotic family idiocy was almost, if not entirely, confined to Jews, and they had always been considered very prone to diabetes. The view that tuberculosis was rare and cancer common amongst Jews required modification. It had not been definitely shown that they were more susceptible to tubercle than other races. In the course of the discussion which followed, Dr. G. E. Spero referred to the effects of dietary laws upon physique, and Dr. David Nabarro pointed out that Jewish abstemiousness as regards alcohol heightened their resistance. So long as the Jewish race adhered to the Mosaic Laws concerning food they were likely to avoid some of the diseases to which non-Jewish inhabitants of the same countries were prone. Dr. Nabarro regarded the nervous system and the mentality of the Jew as of a high order; it was, he thought, more likely to break down under stress, a fact for which persecution had been partly responsible.

HOP-PICKING IN KENT DURING 1926.

FROM time to time in comments on the annual reports for Kent we have referred to the inadequate arrangements made for the reception of the hop-pickers. We have now received from Dr. S. N. Galbraith, medical officer of health for the South-West Kent united health area, a special report on the measures adopted for the health of the hop-pickers during 1926. The report shows that the county council and local authorities, the Southern Railway, the Farmers' Union, and voluntary organisations have combined to form with representatives of the Ministries of Agriculture and Health, a committee for supervision of the work. This committee meets at Maidstone, under the chairmanship of Mr. J. A. Spender. The magnitude of the problem is shown by the fact that last season 25,000 pickers were conveyed by rail to stations in South-West Kent, and that over 45,000 visitors were carried at the week-ends to the Kentish fields. A very large number also travel by road. Dispensaries are established throughout the district by many organisations, including the British Red Cross Society, the Salvation Army and Medical Missionary Societies. Cases of sickness are admitted to various hospitals, and creches are established for ailing babies. Certain occupational diseases are mentioned such as hop rash (237 cases), hopper's eye (95 cases), and hopper's gout (87 cases). Septic sores are common. There were only ten cases of infectious disease notified. The free supply of diarrhœa mixture by the Maidstone and Tonbridge rural district councils was discontinued without any increase of diarrhœa. Many new improved huts have been constructed and many new cookhouses. Water supplies and conveniences have been improved. The inspection of the food has also received close attention. For example, in the Maidstone Rural District 200 lb. of meat and 50 lb. of fish were seized, and in Tonbridge town a motor van containing 1125 lb. of unsound meat on its way to be sold to the pickers was condemned. On some farms prizes are awarded to the pickers who keep their huts and belongings in the best condition. There is some trouble from water wastage, and efforts are being made to provide anti-waste taps for the hopper camps. Accommodation of the 50,000 week-end visitors is very difficult; one farmer estimates that 500 visitors come to his farm at the week-end. The lack of cookhouse accommodation is a source of trouble on most farms, and so is the danger from fires. Dr. A. C. Parsons of the Ministry of Health says: "From observations and enquiries made in the camps in the past two seasons, it is clear that a built-up fireplace and chimney are essential to a suitable cookhouse." The by-laws require one fireplace to 15 pickers.

Eight deaths of hop-pickers or their children were registered. Of these, six were those of infants, including three from gastro-enteritis and one from burns. The report records very creditable effort by the official and voluntary agencies concerned.

CAN TAR CAUSE PULMONARY CANCER?

AN inquest was held on March 5th by the Manchester coroner, Mr. C. W. W. Surridge, on a gas retort worker aged 59, who had been employed by the Manchester Corporation for 26 years. This man was forced to leave his work in March of last year, and subsequently underwent an operation. His duties at the gasworks were to keep the mains clear of tar and to charge up retorts after they had been scraped; he had worked a good deal with tar. The Medical Inspector of Factories, Dr. S. A. Henry, was present, and the corporation was represented. It was stated that the deceased had not worn gloves whilst at work with tar; since he left, gloves had been provided. For the Corporation, it was pointed out that all the men were invited to report any black spots or warts noticed on their bodies. Medical examination was always available, free of charge, and everything possible was provided to keep the employees clean. Dr. Norman Kletz described the result of the post-mortem examination. A healed scar was found on the scrotum, due to a previous operation for epithelioma, but this disease had apparently been completely eliminated. Death was due to a primary growth in the lung. In reply to the coroner, Dr. Kletz stated that there was no connexion between the previous disease of the scrotum and the lung. He was not in a position to say that the growth in the lung could not have been caused by inhaling the fumes of tar, but he had never heard of such a case. In returning an open verdict, the coroner said that there was no doubt that if epithelioma were treated in its earliest phase a complete cure resulted. Death had resulted from heart failure, due to the pulmonary growth, and he was satisfied that there was no connexion between the cause of death and the earlier disease of the scrotum. Only time and further investigation could show whether a cancerous growth in the lung could be produced by working amidst tar fumes. The coroner added: "Years ago it was not known that there was any connexion between disease of the scrotum and external contact with tar. Now that has been proved to be so, and it may be in days to come that the inhalation of tar fumes will show some connexion with growths in the lungs. It is not sufficiently established as yet, and I propose to return an open verdict."

PERSISTENT BOILS.

To the Editor of THE LANCET.

SIR,—I shall be much obliged to any medical man suggesting a cure for persistent boils in a woman of 33; she has been a martyr to them for more than eight years. Vaccines, extraction of all her teeth, injections of manganese, and other drugs too numerous to mention have been tried.

I am, Sir, yours faithfully,

March 5th, 1927. W. L. C.

A CASE OF PREGNANCY FOLLOWING POLYGLANDULAR THERAPY.

To the Editor of THE LANCET.

SIR,—A patient X (aged 30 and married for seven years) was seen by me about six months ago complaining of nervousness, dizziness, and "rounds of hot flushing." Her menstrual history was very irregular; sometimes she went for three months without any menstrual discharge. There was no anæmia, but she had been told some years earlier that she would always be sterile as her uterus and ovaries were not developed.

On pelvic examination I found a very small undeveloped uterus and the ovaries could only just be felt with great difficulty. I kept the patient on ovarian tablets for a month with apparently no result. I then gave her polyglandular tablets containing a mixture of thyroid, thymus, pituitary, suprarenal, mammary, ovarian substance, and cerebrin. Two tablets were given three times a day, and the following week she said that "the rounds of hot flushing" had disappeared and she slept much better. Two months later her uterus and ovaries were found to have increased in size, and at the time of writing all her signs and symptoms point to an early pregnancy. This opinion has also been arrived at by my senior colleague, Dr. A. C. J. Wilson.

My conclusions in this case are that the patient was entering upon a premature menopause caused by a lack of balance of the endocrines resulting in maldevelopment of the uterus and ovarian insufficiency. None of the other ductless glands showed any obvious atrophy or overdevelopment.—I am, Sir, yours faithfully,

A. A. MASSER, M.B., Ch.B.

Penistone, Sheffield, March 3rd, 1927.